A Survey for Townsend's big-eared bat (Plecotus townsendii) and the Spotted bat (Euderma maculata) on Bridger-Teton and Targhee National Forests in Wyoming

A cooperative cost-share project between
Bridger-Teton and Targhee National Forests
and
The Wyoming Natural Diversity Database

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CONTRACT SPECIFICS:

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ABSTRACT:

A survey was conducted on U.S. Forest Service lands in northwestern Wyoming (which includes Bridger-Teton National Forest and Targhee National Forest) for spotted bats (Euderma maculata) and Townsend's big-eared bats (Plecotus townsendii). Mist netting, and listening for bat echolocation calls with the aide of a "QMC Mini-2 bat detector" were used as the primary survey methods. Neither target species was positively located and a review of historical records showed that these species have never been documented in the study area. Information is presented on other species of bats located during the survey including the hoary bat (Lasiurus cinereus), silver-haired bat (Lasionycteris noctivagans), little brown myotis (Myotis lucifugus) and big brown bat (Epistícus fuscus).

BACKGROUND:

Little effort has been directed towards understanding the distribution and status of bats within Wyoming. To date, no comprehensive bat surveys have been conducted in the state. Consequently, many of the bats which occur within Wyoming are listed as being species of concern by various federal, state and private agencies; primarily due to a lack of distribution and abundance information.

SPECIES STATUS:

Two of Wyoming's species of bats, the spotted bat (Euderma maculatum) and Townsend's big-eared bat (Plecotus townsendii), are currently listed on the U.S. Forest Service's Intermountain Region Vertebrate Sensitive Species List. They are also subsequently listed by Region 4 of the USFS which contains the Bridger-Teton National Forest (BTNF) and Targhee National Forest (TNF). Range maps have indicated that both of these species of bats may occur within BTNF and TNF (Clark and Stromberg (1987) and Hall (1981)).

In addition to being listed as sensitive species by the USFS, the Townsend's big-eared bat and the spotted bat are also listed as species of concern by other agencies as outlined below (refer to Vertebrate Species of Concern List (Garber, 1991) for explanation of definitions).

SPECIES STATUS:	WY TNC STATE/GLOBAL	USFS REGION 4	USFWS	WYGF NONGAME
Spotted bat	S1?/ G4	Yes	C2	Priority III
Townsend's big-eared bat	S3?/ G5T2?	Yes	C2	Priority III

In addition to these two species, range maps indicate (Clark and Stromberg (1987)) that three other bat species of concern (as listed by the Nature Conservancy's Wyoming Natural Diversity Database) could be found within the BTNF and TNF. These include:

SPECIES STATUS:	WY TNC STATE/GLOBAL	USFS REGION 4	USFWS	WYGF NONGAME
California myotis (Myotis californicus)	SU/ G5	--	--	Priority III
Silver-haired bat (Lasionycteris noctivagans)	S3?/ G5	--	--	--
Hoary bat (Lasiurus cinereus)	S3?/ G5	--	--	Priority III

Also, other more common species of bats are believed to occur within BTNF and TNF as indicated by distribution maps by Clark and Stromberg (1987). These species include:

SPECIES STATUS:	WY TNC STATE/GLOBAL	USFS REGION 4	USFWS	WYGF NONGAME
Small-footed myotis (Myotis ciliolabrum)	S5/ G5	--	--	--
Little brown myotis (Myotis lucifugus)	S5/ G5	--	--	--
Long-legged myotis (Myotis volans)	S5?/ G5	--	--	--
Long-eared myotis (Myotis evotis)	S5?/ G5	--	--	--
Big brown bat (Eptesicus fuscus)	S5?/ G5	--	--	--

STUDY OBJECTIVES:

Due to a lack of information on the occurrence of these species on both the BTNF and the TNF, this study was conducted. The objectives of this study were:

1). Document the distribution and abundance of Townsend's big-eared bat and the spotted bat on BTNF and TNF lands.

2). Document the distribution and abundance of all other species of bats located in the study area.

KNOWN DISTRIBUTION AND HABITAT USE IN WYOMING AND SURROUNDING STATES:

A comprehensive bibliography on both target species is presented in Appendix 2; interested individuals are encouraged to refer to these sources for detailed life history information. A brief summary of distribution and habitat use is presented below.

Known distribution in states surrounding Wyoming:

A distribution map was prepared for known records of both target species in Wyoming and states surrounding Wyoming (including: Montana, Idaho and Utah). This information is presented in Figure 1. This data was provided by Nongame wildlife and Heritage programs from these states and is current as of Summer 1991. Detailed information was also provided on basic habitat and life history information from this request.

Habitat use:

Spotted bat-

Plant community and life zone types recorded include: Desert to montane forest (Jones in Watkins 1977); ponderosa pine in British Columbia, Canada, in the Oosyos arid region (Woodsworth et al 1981); lower sonoran life zone (Poche 1974); creosote bush (Larea tridentata), mesquite (Prosopis juliflora), tamarix (Tamarix chinensis) and desert willow (Chilopsis linearis) (Ruffner, et al 1979); hayfields and irrigated fields, abandoned fields, orchards and ponderosa pine (Leonard and Fenton 1982); areas of ponderosa pine (Pinus ponderosa) near cliffs and canyons, some records from lowland deserts; most specimens collected from 1968-2624 m in elevation from New Mexico, Colorado and Utah (Barbour and Davis, 1969). In Utah, they have been recorded in pinyon-juniper, oak-brush, aspen, ponderosa pine, and fir habitat types (R. Toone, Utah Natural Heritage Program, Pers. comm.). In Wyoming, several were heard in sagebrush/ grassland- red desert salt shrub habitat at a small pond in the Bighorn Canyon National Recreation Area (Worthington, 1991). The highest elevational record is 3444 m in spruce-fir habitat in New Mexico (Reynolds 1981).

They are known to roost primarily in steep high cliffs (Woodsworth et al. 1981). Leonard and Fenton (1982) found that they roosted alone in steep cliff faces. Of 2 cliffs observed, one was a steep west facing cliff 100 m high and the second was a east facing cliff 100 m high.

Precipitation in areas where this species has been documented include 27 mm precipitation/ yr (Woodsworth et al 1981); rainfall of 150 mm annually (Poche 1974); and annual precipitation of 209 mm (Ruffner, et al 1979).

Leonard and Fenton (1982) noted that they left their roost sites an average of 49 minutes after sunset; they were usually observed foraging in association with trees and had individual foraging areas in which they flew about 10 m high in elliptical routes about 40-70 m long.

Townsend's big eared bat-

Recorded habitats in the western U.S. include desert scrub, pinyon-juniper and pine forest regions; primarily a cave dwelling species but also uses mines; recorded from sea level to 3149 m in elevation (Barbour and Davis, 1969). In Oklahoma, habitats include "mid-grass prairie vegetation" with mesquite (Prosopis juliflora) and sage (Artemisia spp.) with riparian vegetation including cottonwoods (Populus deltoides) and willows (Salix spp.) (Humphery and Kunz, 1976).

Figure 1.

Distribution of Townsend's big-eared bat and spotted bat records in Wyoming, Utah, Idaho and Montana

Townsend's big-eared bat

Spotted bat

In Wyoming, the majority of records for Townsend's big-eared bat are from southeastern portions of the state. Many of these are records of specimens collected from mines, some were recorded as occurring in pine-juniper habitats. In central Wyoming, the author checked habitat near 2 caves known to harbor this species, both were in juniper- sagebrush habitat.

They are known to be very susceptible to human disturbance, and may abandon roost sites with minimal disturbance (Barbour and Davis, 1969).

STUDY AREA:

The study area was confined to those portions of BTNF and TNF occurring within Wyoming (See Figure 2). Sampled areas are indicated by numbers on the map and these numbers correspond to the field notes presented in Appendix 3.

Climate:

The climate of the study area is characterized as being cold, with moderate humidity. Elevations range from 1935 m to 4522 m and the majority of the forest is at elevations above 2296 m. These elevational ranges encompass climates ranging from desert to alpine conditions. The mean annual temperature is 0 degrees Celsius. Total annual precipitation is 36-152 mm; most of this precipitation is deposited at high elevations in the Teton and Wind River Mountains. Snowfall accounts for about 2/3 of the total precipitation (U.S. Forest Service 1989).

Vegetation:

As alluded to above, areas at the lowest elevations receive the least precipitation and therefore the vegetation at low elevations is representative of desert habitats of Wyoming, particularly in the southern end of the study area. Lowland desert habitats are typically represented by big sage (Artemisia tridentata) and various grasses and forbs with willows (Salix spp.) grasses and sedges (Carex spp.) along riparian areas. Lowland desert habitat types represent a minor portion of the overall study area.

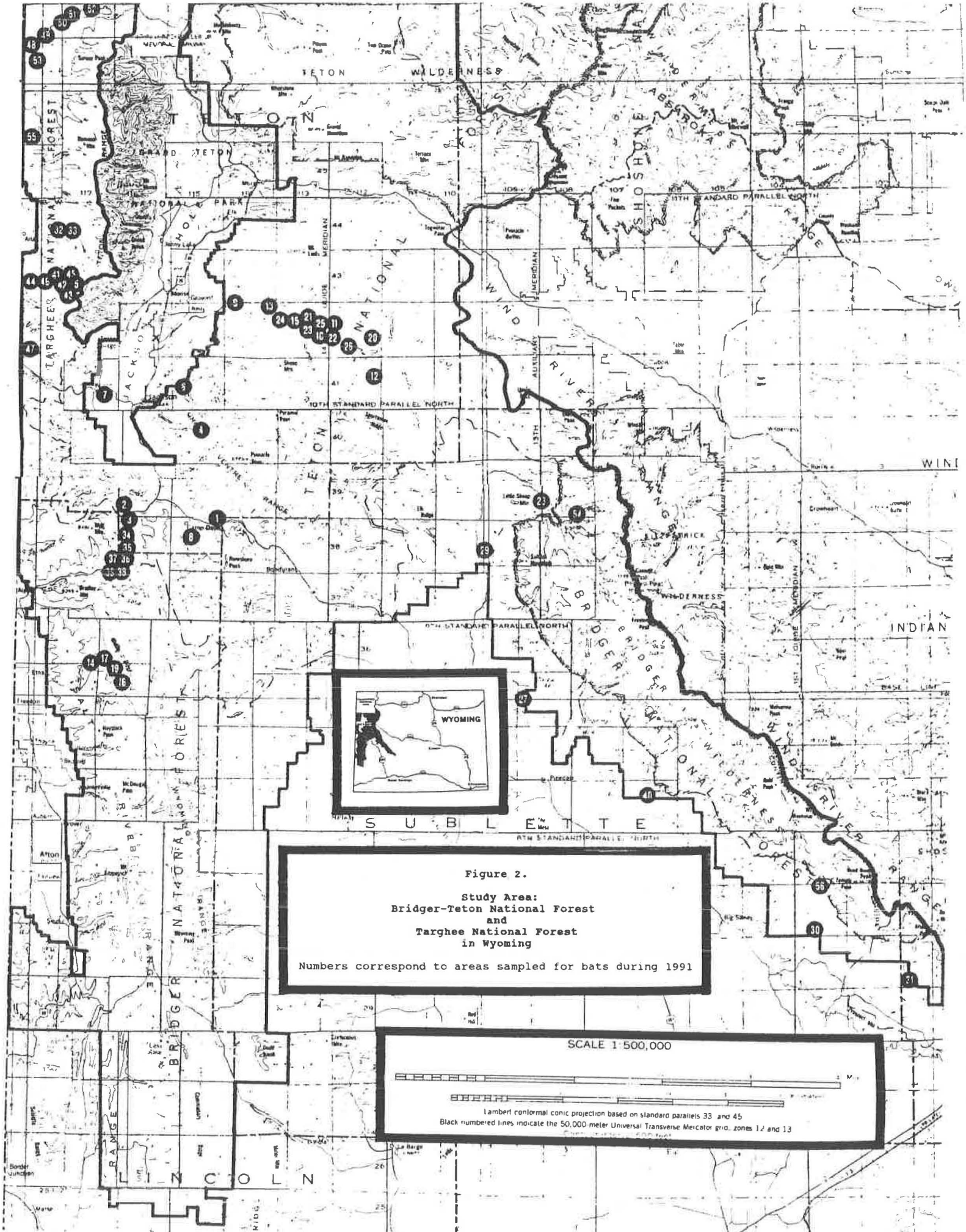

Figure 2.

Study Area:
Bridger-Teton National Forest
and
Targhee National Forest
in Wyoming

Numbers correspond to areas sampled for bats during 1991

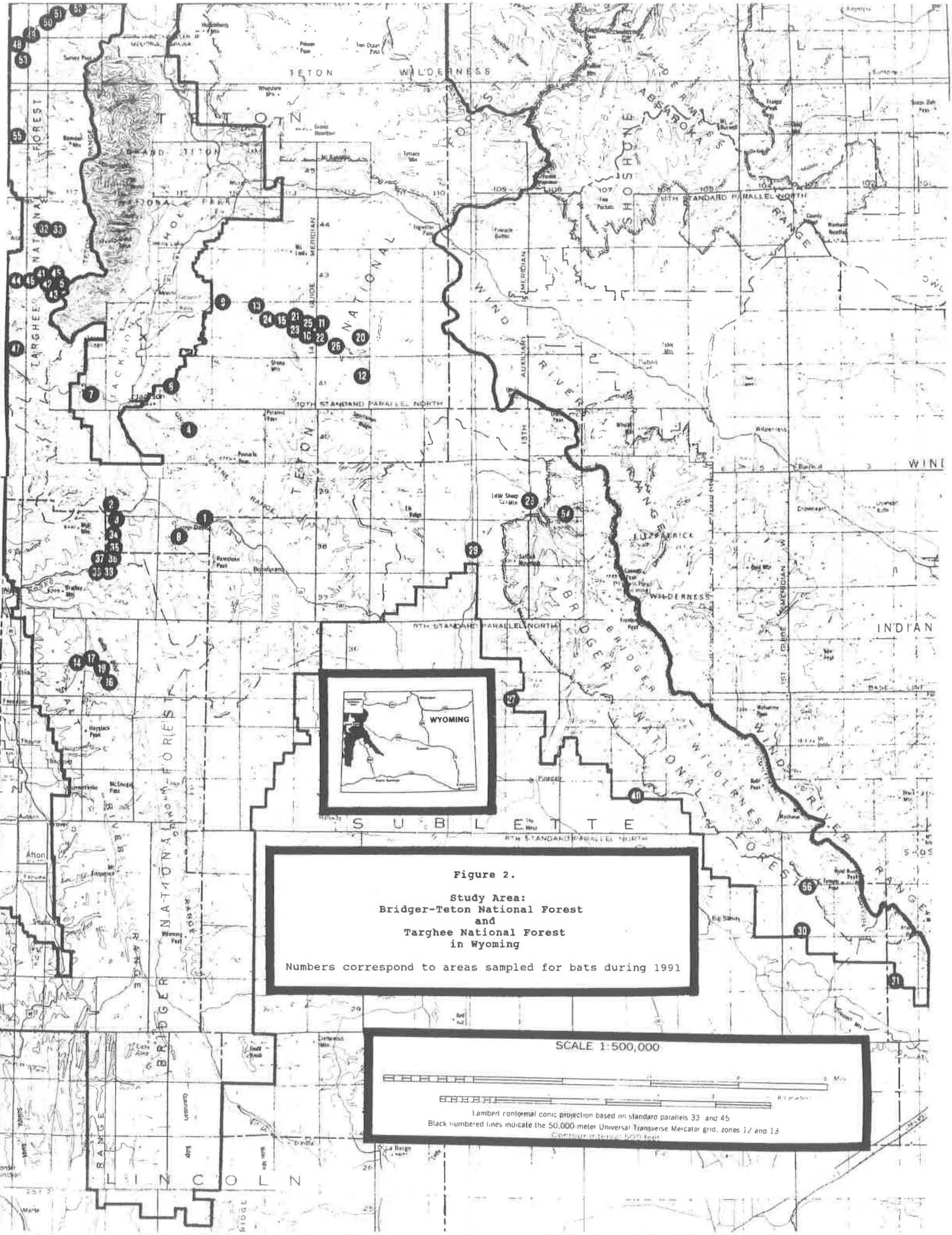

Figure 2.

Study Area:
Bridger-Teton National Forest
and
Targhee National Forest
in Wyoming

Numbers correspond to areas sampled for bats during 1991

At higher elevation areas, there is a transition from desert habitats to aspen (Populus tremuloides), lodgepole pine (Pinus contorta) with the majority of the area being big sage and grasses. Again, riparian areas are usually represented by willows, grasses and sedges with cottonwoods (Populus spp.). At higher elevations, coniferous forests are found represented by Douglas fir (Psudotsuga menzezeii) and Engelmann spruce (Picea engelmanii). At a further increase in elevation, these conifers are found interspersed with subalpine fir (Abies lasiocarpa). In the highest areas, alpine vegetation associations typical for Wyoming are found.

Most of the drainages have creeks or rivers flowing year round throughout them. The larger high elevation rivers typically have extensive have wetland/ willow complexes; dotted with ponds or lakes on the valley floor.

Caves:

There are at over 120 known caves and "shelters" within TNF (Linda Mergiliano, Pers. comm.) within Wyoming and at least 20 in BTNF in Wyoming (Hill, et al., 1976). In addition, there are numerous cliffs and fractured cliff faces which may serve as potential roost sites for both the spotted bat and Townsend's big-eared bat.

METHODS:

Efforts were directed toward surveying potential habitats for the two target species of bats. Data on other bat species encountered were also recorded. Two primary survey methods were used:

1.) Listening for species specific echolocation calls of bats at roosting areas and foraging areas using a "QMC Mini-2 bat detector".

The bat detector is a frequency shifting device which allows the listener to hear replications of bat echolocation calls at frequencies audible to humans; a calibrated dial allows the user to determine frequency ranges and peak energy within that frequency range to aid in identifying bats by their species specific calls. A key was developed for identifying Wyoming bats (Appendix 6). The bat detector was also used to identify areas of heavy bat use to assist in selecting ideal areas for mist netting.

The bat detector was calibrated prior to the study to ensure its accuracy as discussed by Thomas and West (1984). To calibrate, decibel sound pressure level was measured using a Bruel and Kjaer type 26-10 measuring amplifier and a B & K type 4230 sound level calibrater in conjunction with a broadband microphone and speaker. The calibrated dial on the detector was found to accurately correspond to generated frequencies.

The echolocation calls of the bats found in Wyoming are generally inaudible to the unaided ear, with the exception of the spotted bat, which has its entire echolocation calls within the range of human hearing. To assist in identifying spotted bats in the field, replications of spotted bat echolocation calls were electronically generated and played through a speaker for reference. Generated frequencies were based frequency characteristics as presented by Thomas et al (1987).

2.) Mist netting at roosting areas and foraging areas.

Mist nets were generally placed over open water (streams, rivers, ponds) usually in areas where the mist net was wider than the body of water to increase the likelihood of bats flying into the net while foraging over water. Mist nets were also set at areas previously identified as being ideal for trapping bats as previously located while surveying with the QMC bat detector.

Potential or known roost sites were also be searched for and checked for bat presence. Individual spelunkers and caving organizations from the study area, Wyoming and Idaho, were contacted for information on bats use observed in caves. Also, a request was made to each USFS district office to provide information on potential bat habitat (caves, mines, etc.).

Bats captured in mist nets were identified, measured and usually released. Data on standard physical measurements, assessment of overall condition and breeding condition were recorded. Roosting and foraging sites were recorded along with species composition and numbers.

Surveys were designed either to either check specific "points", i.e. a certain cave, building or pond; or by running transect routes to listen for bats at each station using the bat detector. A combination of both of these techniques were used.

Transects were generally started at dusk and run until about 3 hours after dusk. It was found that the peak of bat activity took place during this time period as previously noted by Kunz (1973). Transects were generally run along secondary gravel roads and listening points were stationed every 1/2 mile. At each listening station 10 minutes were spent listening with both the bat detector and the unaided ear monitoring to monitor bat

activity. Bat call frequencies were recorded and identified species were noted. In some instances, the number of passes per species was recorded, but it was later felt that an analysis of this information would not be meaningful because calls may represent more than one bat or repeated passes by a single bat. Also, if this information was recorded it would not be statistically valid if future comparisons were made on bat population estimates to the area during future surveys as discussed by Kunz and (Brock 1975) and Fenton, et al. (1973). Also, Thomas (1988a,b) felt that bat detectors do not provide data that can be used to directly estimate population density. Instead of recording the number of passes by bats, the number of bats using an area were estimated using visual observation (by using high powered hand held lights) which was usually only practical at stationary locations. Basic habitat information was recorded for each area sampled.

Using the bat detector was the primary method used to sample most areas instead of, or in conjunction with, mist nets. The reason for doing this was primarily one of efficiency, to sample the most areas in the shortest time possible. The time spent setting up and monitoring a mist net is less efficient than checking several areas per night using the bat detector while running a transect; not to mention the difficulty of assembling and dismantling a mist net by oneself in the dark! In addition, the mist net only samples a relatively small area (a 3.5 m X 13 m net was used) while the detector can cover a larger area. Further discussion of the advantages of using bat detectors verses mist nest is discussed by Kunz and Brock (1975).

The bat detector was usually kept tuned to the frequency of 39 kHz, since all echolocation frequencies of bats found in Wyoming overlap this frequency at some point in their individual frequency range (with the exception of the spotted bat which is audible to the unaided ear). Theoretically, detected bats could then be identified by their echolocation frequency range, frequency of peak energy, and call duration (see Appendix 6 for detailed information).

Unfortunately, frequency ranges and peak frequencies as reported in the literature varied from what was found in the field during this survey. Regional and individual variation of frequency ranges of bats have previously been discussed by Thomas, et al (1987). Because of the potential for regional frequency variation, an effort was made to verify bat echolocation calls for each species. Each time a unidentified species was noted while using the bat detector, an effort was made to catch a specimen to verify species type and listen to their echolocation calls while in captivity. Verifying echolocation call characteristics, observing and recording flight characteristics and emergence times helped to identify bats observed in the field which were not captured.

Because the study area is so large, and since much of the area is not accessible by vehicle, areas surveyed were primarily confined to the "front country" that is, areas easily accessible by vehicle or by short day hikes. This was done to sample as many areas as possible, over the largest area possible, in the limited time allotted. In addition, low elevation areas where roads are present generally were found to pass over what was usually found to be inhabited by the largest numbers of bats.

One area, the Gros Ventre River Valley, was sampled intensively and repeatedly.

Only a few caves were entered for safety reasons since the author was generally working alone. In addition, the large number of caves in the study area precluded checking them all during this season. Therefore, spelunkers were contacted for information on bat sightings in specific caves.

RESULTS:

The survey was started on 24 May 91 and completed on 24 September 91. A total of 56 areas were sampled including specific areas, transects, caves and roosts. Several areas were sampled repeatedly.

A total of 30 areas were sampled in BTNF and 22 in TNF; 1 area was searched on private land and 1 area was checked on US Fish and Wildlife Service land, both of these sites were adjacent to USFS lands.

Fourteen nights were spent mist netting for a total of 22.5 hours time. Fifty-four areas were checked with the bat detector (some areas were repeatedly checked at different dates) for a total of 55.25 hrs. Nine caves/ roost sites were checked for a total of 38.5 hrs.

Neither Townsend's big eared bat or the spotted bat were detected during this survey.

Bats were detected at 39 of the 56 areas sampled. Most of the bats detected were little brown myotis which were the most common bat in the area. The second most common species was the hoary bat; 16 areas were found where this species was present. Previous to this survey there were only about 9 records of hoary bats recorded in Wyoming; this indicates that this species, which was thought to be rare, may be more common than previously believed.

General habitat types sampled during the survey are represented as follows:

Figure 3.
General habitat types sampled

Habitat type	Number of times represented
caves	-6 (no bats found in this habitat type)
manmade	-6
riparian	-28
open water	-42
clearings	-23
grasslands	-2
shrublands	-18
forested	-34
alpine	-2 (no bats found in this habitat type)
cliffs	-9

Note: One or more habitat types may have been present at each site. Although an effort was made to survey near sites with cliffs, this habitat type was not recorded unless immediately adjacent to the area being surveyed.

Areas sampled ranged in elevation from 1840-3035 m average being 2226 m (n=53).

The frequency characteristics of calls for captured bats (and subsequently identified free ranging bats) varied greatly from spectral descriptions reported in the literature. Three species were captured and verified including the little brown myotis, hoary bat and Townsend's big-eared bat (the latter from a cave that the author found in the Shirley Basin area of Wyoming during the summer of 1991, outside of the USFS study area).

For all of these species, spectral characteristics as reported in the literature were different than what was observed in the field.

For the little brown myotis, previously reported frequency ranges have been recorded from 34-88 kHz, with peak energy at about 45 kHz; with the maximum detectable distance being 12 m (Thomas et al 1987). In this study, frequency ranges were recorded from 30-110 kHz, with peak energy at 44 kHz, and maximum detectable distance at 8 m. Frequency range at the limits of the maximum detectable distance was usually "narrower" being about 30-75 kHz.

For the hoary bat, previously reported frequency ranges have been recorded from 17-41 kHz, with peak energy at about 28 or 38 kHz; with the maximum detectable distance being 10 m (Thomas, et al 1987; Barclay 1986). During this study, frequency ranges were

recorded from 20-75 kHz, with peak energy at 25 kHz, and maximum detectable distance 25 m; although frequency range at the limits of the maximum detectable distance were usually about 20-40 kHz.

For Townsend's big-eared bat previously reported frequency ranges have been recorded from 20-50 kHz, with peak energy at about 27 kHz; with the maximum detectable distance previously unreported (Thomas et al 1987). During this study, one captive bat was observed to have a frequency range of 25-75 kHz, with peak energy at 29 kHz and a second, much "quieter" peak at 75 kHz (the latter peak may have been a secondary harmonic). Maximum detectable distance was 5 m; although frequency range at the limits of the maximum detectable distance were about 26-35 kHz. Detectability quickly decreased when more than 4 m distant from the bat.

Other possible species of bats which may have been detected based on frequency information, but were not verified through capture, include the silver-haired bat with 11 records; the big brown bat with 3 records and the fringed myotis with 2 records (the records for fringed myotis may be unlikely since this is out of the currently reported range in Wyoming for this species).

Frequency information for what were believed to be silver-haired bats in this study were recorded as having range of 25-60 kHz with a peak at about 35/38 kHz; maximum detectable distance was 16 m.

Since different species of Myotis supposedly cannot be distinguished from one another using the QMC Mini-2 bat detector (Thomas 1988b) it is possible that a few of the observations recorded as little brown myotis some may have been other species of myotis. However, most were believed to be that little brown myotis, based on captured bats, emergence times, flight and foraging characteristics and echolocation characteristics.

Using the bat detector allowed for the confirmation of bats which would have otherwise have overlooked if only the mist net had been used. It was found that foraging bats were difficult to capture using mist nets for several reasons. Bats in this and other studies often were often found to forage over water (since insect numbers were observed to be higher in these areas), and drink from water while flying, making them concentrate in these areas which makes them more susceptible to trapping. However, in this study area, bodies of water suitable for foraging are very numerous which results in bats being dispersed over large areas; unlike more arid environments where limited areas of water can concentrate bats and make them more susceptible to trapping. ALso, bats were often observed flying up to the net and avoiding it at the last moment, even on perfectly calm nights when the net was not moving. Therefore, the bat detector was found to be a more reliable method for determining bat presence.

SUMMARY:

Neither the spotted bat or Townsend's big-eared bat were positively located during in the study area during this survey. Although both species are typically local and limited in their distribution, they should have been detected during this survey if they were present in any great numbers. At one sample area (area #052 in Appendix 3) a bat was heard which may have been a Townsend's big-eared bat.

Spotted bats are audible at distances up to 250 m (Woodsworth, et al 1981), the greatest detectable distance of any of bat found in Wyoming, including those which must be monitored with a bat detector. Considering that this species is so loud, and was not detected, it is probably unlikely that it occurs on BTNF or TNF lands in the areas surveyed. If it does occur, it probably does so at the southern end of BTNF, where most of the desert habitat occurs in the study area.

Townsend's big-eared bat is only detectable at very close distances, probably a maximum of 5 m, which is the least known distance of any Wyoming bat. They consequently would be easy to escape detection when compared to the spotted bat. For this reason, it is possible that they may be present in the study area in low numbers.

From reviewing habitat preferences of spotted bats in the literature, potential habitat does not exist in any great quantity in the study area. Again, the most likely habitat is located in the southern end of BTNF. Also, the majority of elevational records for this species are below the elevations which are found within the study area (see Figure 4).

Although there are elevational distribution records from adjacent states for both target species which fall within elevations in the study area, these records are probably at the upper limits of the elevational distribution for these species. Most of these high elevation records come from southern Utah where the climate and vegetation is substantially different from the study area and falls within a separate "life zone". For both the spotted bat and Townsend's big-eared bat, most of the records fall within the Upper Austral zone, with some records in the Transition zone as defined by Merriam, whereas most of the study area is classified as Canadian.

Figure 4.

Distribution and elevation records of Townsend's big-eared bat and the spotted bat in Wyoming, Idaho, Utah and Montana:

Species:	Number of records by state:	Elevation information: Range	Average	
Spotted bat	WY-3	1100-1319m	mean 1210	n=2
	ID-3	754-935m	mean 845	n=2
	MT-5	1050-1377m	mean 1214	n=2
	UT-13	970-2801m	mean 1930	n=15
totals:	24	754-2801m	mean 1300	n=21
Townsend's big-eared bat	WY-23	1291-2270m	mean 2144	n=16
	ID-29	830-1984m	mean 1532	n=29
	MT- 8	656-2558m	mean 1558	n=6
	UT-10 (limited data)	1640-2460m	mean 2014	n=8
totals:	70	635-2558m	1812	n=59

It is felt by the author, and spelunkers familiar with the study area, that most of the caves are too high in elevation and subsequently too cold to support populations of Townsend's big-eared bats, or other cave dwelling bats. Elevations in the BTNF range from 1935 m to 4521 m and most of the forest is above 2295 m USFS (1989). Sampled elevations ranged from 1840-3035 m; the average being 2226 m (n=53). The average elevations sampled were lower than the above mentioned elevation where most of the U.S. Forest lands are located. The majority of the caves entrances in the study area are above 2952 m and many are north facing; these caves may be too cool for too long to be suitable for most cave dwelling bats. Most of these areas in the vicinity of these caves are not free of snow until mid July; subsequently there is probably not enough forage in the areas surrounding the caves to support bats.

In addition, Townsend's big-eared bats are typically found roosting in exposed areas near the entrance of the caves and are typically highly visible (Barbour and Davis 1969); if they were present in a cave, they would likely be detected by most cavers. Of all the contacted persons knowledgeable about caves in the area (9), only two had reported seeing any bats in any caves. Virtually all these observations were of single bats (about 13 observations by 2 observers). There was one observation of two bats in a cave. Of all the persons contacted, it is estimated that about 30 caves have been checked in the study area, with the number approaching 100 if "shelters" are included. No large

colonies of bats were reported. Accounts of bats reported were either flying or hiding in crevices; it is unlikely that any of these observations represent Townsend's big-eared bats.

It is recommended that further studies be conducted to survey for bats on both BTNF and TNF lands, especially in areas not checked during this survey. It is unlikely that the spotted bat occurs on either BTNF or TNF lands in Wyoming, if it does, it is probably very rare. Townsend's big-eared bat may occur on these lands, but is probably rare and locally restricted. It is suggested that all known caves and mine-shafts be documented and surveyed for bats as time allows. These areas should be surveyed for bats prior to any land management practices which could negatively impact bat populations (especially Townsend's big-eared bat). Cliff habitats which may be suitable for spotted bats should also receive the same consideration.

Areas not checked during this survey should also be checked; more detailed investigations of caves may be warranted. If future surveys are to be conducted, it is recommended that the same type of techniques be used as in this survey, but with using a "count-down" or "divide-by-10" bat detector coupled with an oscilloscope and tape recorder to help differentiate between the different species of Myotis, if more than one species is present. In addition, it is recommended that if any caves are located which contain Townsend's big-eared bats, that they be considered as "significant" caves under the Federal Cave Resources Protection Act and that measures be taken to ensure the roosts continued use, such as placing gates over caves.

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APPENDIX 1: SPELELOLOGICAL CONTACTS

Rick Riggs-Idaho Falls, ID (208) 524-5688. Has been in about 20-30 caves in the study area, about 100 total if "shelters" are included. Stated that most of the caves in the area are above 2950 m and that it is until about mid July when the snow in these areas disappears. Most of the caves he has visited have been in the Tetons, Crystal Creek, Gros Ventres and Shoal Creek areas. He has seen very few bats in caves over the years, maybe a total of about 12, of single bats. He mentioned that cave beetles have been found in Wind cave. Probably the most knowledgeable contact about caves in the area.

Tracy Hanson- Alta, WY (307) 353-2950. Has been in about 3-4 caves total in the study area; has not seen any bats in caves.

Jean Benedict- ID, (208) 523-7527. Has seen bats (2) in one cave located on the main fork of Darby Creek in Darby Canyon. She has never seen bats in Wind or Ice Caves; has been in about 6 caves in the study area.

Linda Merigliano- USFS, Targhee NF, Teton Basin District Wilderness Specialist (208) 354-2312. Reported that there are over 100 caves in the Targhee National Forest's Teton Basin District, most of Which are in Wilderness areas. She mentioned that Warren Anderson and Rick Riggs were working on the Federal Cave Protection Act in identifying "significant" caves.

Warren Anderson- 2025 Wilson/ Moose Rd.; Wilson, WY (307) 733-9168. Has been working on the Federal Cave Resources Protection Act with Rick Riggs; he has not reported seeing any bats in any of the caves he has visited in the study area.

Michael Whitfield- (208) 456-2378. Has not seen any bats in any of the caves he has visited in the study area.

Miles Heckner- Casper, WY (307) 237-2612; NRS Survey. He maintains a database on caves in Wyoming. He, nor anyone to his knowledge, have reported seeing any bats in any of the caves in the study area. He also mentioned two other caving groups: Hole in the Wall Grotto is active in Casper (?) and the Main Lead Grotto in Greybull, neither contacted.

Wayne Sutherland- (one of three authors of Caves of Wyoming); The Geological Survey of Wyoming, Box 3008, University of Wyoming, Laramie, WY. (307) 766-2653. He has not seen any bats in any of the caves in the study area and felt that although the area is well developed as far as habitat for bats (caves, karst topography, etc.) the caves in the study area are at too high of an elevation, and subsequently too cold, to support bat populations.

Bob Luce- Wyoming Department of Game and Fish, Nongame Mammal Biologist, 260 Buena Vista, Lander, WY (307) 332-2688. He did not no of any caves in the study area which supported bat populations.

U.S. Forest Service District Wildlife Biologists- None of the biologists contacted had any knowledge of any bat roosts or caves used by bats in the study area. One bat roost was mentioned by Teton Basin District (TNF) biologists at the old lodge at Mesa Falls (S13 T010NR044E, ID) which is outside of the study area. A small colony of little brown myotis were observed roosting in small groups in the rafters of the second floor and in the vicinity of the chimney in the middle of one room. It was obvious that this area receives moderate use by bats as indicated by substantial accumulations of droppings under roost sites. Only about 10 bats were observed and two dead bats were found. It was also apparent that people had been disturbing the bats (as indicated by long sticks under the roosts used for poking at bats and the lack of bats in relation to the large accumulation of guano. There are plans to renovate this building in the near future; renovation plans should take into the consideration the bats welfare and plan accordingly; i.e. construct bat houses in the eaves of the building prior to sealing it off from bats. This also present the opportunity for an interpretive display for bats.

APPENDIX 2: BIBLIOGRAPHY FOR THE SPOTTED BAT AND TOWNSEND'S BIG-EARED BAT

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APPENDIX 3: LISTING OF LOCATIONS CHECKED FOR BATS

Note: Numbers listed below corespond to points on map in Figure 2.

*001 BAT SURVEY STATION
County: Teton Elevation: 2200M
Meridian: 6P Town/Range -Section: 038N115W -03
Location: ALONG NORTH SIDE OF HOBACK RIVER, IN HOBACK CANYON AT STINKING SPRINGS
EO Data: BAT SURVEY; CHECKED ALONG BASE OF CLIFF ON NORTH SIDE OF HOBACK RIVER FOR BAT CAVES (4 HRS TOTAL TIME); NONE FOUND; ALSO SURVEYED USING BAT DETECTOR FROM 2230-2300 HRS (.5 HRS TOTAL TIME) ALONG HWY IN HOBACK CANYON EAST OF STINKING SPRINGS; NONE HEARD. HABITATS INCLUDED CAVES, RIPARIAN, SHRUBLAND, CLIFFS AND CANYON.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-05-24
Quad Name: CAMP DAVIS Precision: S
BULL CREEK

*002 BAT SURVEY STATION
County: Teton Elevation: 1860M
Meridian: 6P Town/Range -Section: 038N117W -30 S30, 31
Location: ALONG USFS RD #31000 FROM COTTONWOOD CREEK WORK CENTER TO PRITCHARD PASS AND BACK AGAIN
EO Data: BAT SURVEY; LISTENED WITH BAT DETECTOR ALONG USFS RD; WALKED ALONG ROAD FROM 1022-0002 HRS (3 HRS TOTAL TIME). HABITATS INCLUDED RIPARIAN, OPEN WATER, CLEARINGS, SHRUBLAND, FORESTED AREA/ OPEN MEADOWS, POND, CONIFERS, ASPENS.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-05-24
Quad Name: MUNGER MOUNTAIN Precision: G

*003 BAT SURVEY STATION
County: Teton Elevation: 1860M
Meridian: 6P Town/Range -Section: 038N117W -31
Location: COTTONWOOD CREEK WORK CENTER; ALONG USFS RD #31000
EO Data: BAT SURVEY; LOCATED 4 LITTLE BROWN BATS IN SW CORNER OF EASTERN LOG BUNKHOUSE IN CRACK BETWEEN LOGS; BATS LEFT ROOST AT 2140 AND RETURNED AT ABOUT 2330; HABITATS INCLUDED RIPARIAN, OPEN WATER, CLEARINGS, SHRUBLAND, FORESTED AREA/ OPEN MEADOWS, POND, CONIFERS, ASPENS.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-05-24
Quad Name: MUNGER MOUNTAIN Precision: S

*004 BAT SURVEY STATION
County: Teton Elevation: 2460M
Meridian: 6P Town/Range -Section: 040N115W -09 SW4 S09, SE4NE4 S10
Location: 6 MI SE OF JACKSON; CACHE CREEK DRAINAGE; 2 ABANDONED MINES- "JACKSON MINE" AND ANOTHER UNNAMED MINE IN NOOKER MINE DRAW.
EO Data: BAT SURVEY; CHECKED 2 ABANDONED MINES FOR BATS; BOTH MINES FILLED IN; NO BATS PRESENT
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-05-27
Quad Name: CACHE CREEK Precision: S

*005 BAT SURVEY STATION

County: Teton Elevation: 2855M
Meridian: 6P Town/Range -Section: 043N118W -24 SE4
Location: 9 MI NW OF TETON VILLAGE; DARBY CREEK DRAINAGE (SOUTH FORK) AT WIND CAVE
EO Data: BAT SURVEY; CHECKED WIND CAVE FOR BATS WITH BAT DETECTOR AND LOOKING FOR SIGN OF BATS (DROPPINGS, ETC); NONE LOCATED, NO SIGN LOCATED; ICE COLUMNS IN CAVE UP TO 3' IN DIAMETER, PROBABLY TOO COLD FOR BATS; CAVE RECEIVES HIGH HUMAN USE. CHECKED AT 1530 HRS FOR 0.5 HRS. HABITATS INCLUDED CAVE, CREEK SUBALPINE MEADOW, SUBALPINE CONIFEROUS FOREST. ABOUT .75- 1 M OF SNOW ON GROUND.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-05-28
Quad Name: MOUNT BANNON Precision: S

*006 BAT SURVEY STATION

County: Teton Elevation: 1950M
Meridian: 6P Town/Range -Section: 041N115W -18 SE4
Location: 2 MI NE OF JACKSON; ON USFWS NATIONAL ELK REFUGE; AT REFUGE STAFF RESIDENCE
EO Data: BAT SURVEY; LITTLE BROWN BATS ROOSTING IN EAVE OF REFUGE STAFF RESIDENCE IN SW CORNER OF FRONT PORCH OF LOG HOUSE; BATS EMERGED AT TWILIGHT (2110 HRS); SPENT 1 HR OBSERVING; HABITATS INCLUDED MANMADE STRUCTURES, CLEARINGS AND OPEN WET MEADOWS. ABOUT 8 OBSERVED; CAUGHT AND RELEASED 4 (MIST NET). MEASUREMENTS FOR COLLECTED SPECIMENS: #1). ADULT, TL: 87, HF: 7, EAR: 10, TRAGUS, 3, FOREARM: 40; #2). ADULT, HF: 6, EAR: 11; TRAGUS:4, FOREARM: 37 (THESE MEASUREMENTS FROM A MUMMIFIED SPECIMEN COLLECTED BY T. LANIER).
Management Unit: NATIONAL ELK REFUGE
Date Last surveyed: 1991-05-29
Quad Name: JACKSON Precision: S

*007 BAT SURVEY STATION

County: Teton Elevation: 1840M
Meridian: 6P Town/Range -Section: 041N117W -25 NE4
Location: ABOUT 2.5 MI NNW OF JACKSON; MANMADE POND ON S SIDE OF HWY22
EO Data: BAT SURVEY; SET UP MIST NET AND USED BAT DETECTOR AT SMALL POND ALONG PENINSULA IN MIDDLE OF POND; NONE CAUGHT, BUT 1 PASS PER EVERY 3-5 MINUTES BY LITTLE BROWN BATS; 2130- 2230 HRS (1 HR TOTAL TIME); HABITATS INCLUDED OPEN WATER AND WET MEADOWS.
Management Unit: SNYDER, PRIVATE, TNC EASEMENT ON PROPERTY
Date Last surveyed: 1991-05-31
Quad Name: JACKSON Precision: S

*008 BAT SURVEY STATION

County: Teton Elevation: 2200M
Meridian: 6P Town/Range -Section: 038N115W -09 S 09,16; SURVEYED ALONG USFS RD
Location: 6 MI SE OF HOBACK JUNCTION; JUST SOUTH OF CAMP DAVIS, SOUTH OF HOBACK RIVER ON USFS RD #30460
EO Data: BAT SURVEY; SURVEYED ALONG USFS RD #30460 AT .25 MI INTERVALS (FOR 10 MIN) FOR A TOTAL OF 3.5 MI; USED BAT DETECTOR; 5 STOPS; FROM 2150-2210 (1.5 HRS); NONE HEARD; HABITATS INCLUDED: CAVES, RIPARIAN, OPEN WATER (CREEK), GRASSLANDS, SHRUBLAND, FORESTED AREA (CONIFEROUS AND ASPEN) AND CLIFFS. ALSO CHECKED CAVES ABOVE ROAD- SMALL SOLUTION HOLES NEAR TOP OF CLIFF ON EAST SIDE OF ROAD; COULD NOT GET INTO ANY OF THEM.
Management Unit: BRIDGER-TETON NATIONAL FOREST

Date Last surveyed: 1991-06-01
Quad Name: CAMP DAVIS Precision: M

*009 BAT SURVEY STATION
County: Teton Elevation: 2400M
Meridian: 6P Town/Range -Section: 042N114W -06 R114W-S6,5,4,3,2,12; 115W-7,8,17,16,15,14,24,19,30,29; THOSE PORTIONS OF USFS RD #30400 ALONG THESE SECTIONS
Location: ALONG GROS VENTRE RIVER; ALONG USFS RD #30400 TRAVELING EAST
EO Data: BAT SURVEY; SURVEYED PORTIONS ALONG USFS RD #30400 AT 0.5 MI INTERVALS FOR 10 MIN; 6 STATIONS TOTAL; FROM 2230-2342 (1.25 HRS); 2 HEARD AT STATION #2 AT 38 KHZ; 1 HEARD AT STATION #3 AT 38-50 KHZ; HABITATS INCLUDED RIPARIAN, OPEN WATER (RIVER); CLEARINGS, SHRUBLAND (SAGE/ WILLOWS), AND FORESTED (ASPENS/ CONIFERS).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-06-07
Quad Name: SHADOW MOUNTAIN Precision: S

*010 BAT SURVEY STATION
County: Teton Elevation: 2410M
Meridian: 6P Town/Range -Section: 042N113W -24 SW4SE4
Location: GROS VENTRE RIVER DRAINAGE; AT GOOSE LAKE
EO Data: BAT SURVEY; USED BAT DETECTOR AND MIST NET; FROM 2130-2315 HRS (1.75 HRS); HOARY BAT- ABOUT 4 OBSERVED, FREQUENCY RANGE 20-40 KHZ, PEAK AT 25 KHZ, DETECTABLE DISTANCE ABOUT 50', SLOW, LOUD PUTT-LIKE CALLS, LARGE BAT FLIES ABOUT 15-40' ABOVE WATER, EMERGED BEFORE LITTLE BROWN BAT, AT DUSK, ABOUT 2145 HRS; LITTLE BROWN BAT EMERGED ABOUT 15 MIN LATER; SLOW FLIGHT, HIGHLY MANEUVERABLE, SOMETIMES SPEEDS UP IN FLIGHT; LEFT ABOUT 1/2 HR AFTER ARRIVAL. LITTLE BROWN BAT; FREQUENCY RANGE? TO 100 KHZ, PEAK AT 44 KHZ, DETECTABLE DISTANCE 25', RAPID PUTTS, SPEEDING UP TO FUZZY SOUND WHEN CLOSING IN ON AN INSECT, EMERGES JUST AFTER DUSK (ABOUT 2130-2150 IN JUNE), FLIES QUICK AND LOW OVER WATER- FROM WATER LEVEL TO 5' ABOVE WATER, USUALLY 1-2' ABOVE WATER, USUALLY FORAGE FOR ABOUT 2 HRS AND THEN LEAVE AREA. HEARD ABOUT 5 AND CAUGHT 2- RELEASED, NOT MEASURED. ALSO SURVEYED AGAIN ON 20 JUNE; USED MIST NET AND BAT DETECTOR; FROM 2130-2330 HRS (2 HRS TOTAL); ABOUT 10 LITTLE BROWN BATS OBSERVED; ABOUT 3 UNIDENT BATS OBSERVED AGAIN (SAME AS ABOVE), THESE LEFT SHORTLY AFTER ARRIVING. CHECKED AGAIN ON 10 JULY, NOT AS MANY BATS, ONLY HEARD 2 LITTLE BROWN BATS FROM 2200-2230 HRS (0.5 HRS TOTAL).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-06-18 1991-07-10
Quad Name: UPPER SLIDE LAKE Precision: S

*011 BAT SURVEY STATION
County: Teton Elevation: 2420M
Meridian: 6P Town/Range -Section: 042N112W -19 NE4NW4
Location: GROS VENTRE RIVER VALLEY; DALLAS LAKE
EO Data: BAT SURVEY; USED MIST NET AND BAT DETECTOR; FROM 2130-2230 HRS (1 HR TOTAL); HABITATS INCLUDED: OPEN WATER (BEAVER PONDS) AND CLEARINGS (WET MEADOWS); HEARD 1 LITTLE BROWN BAT AT 2217; NONE CAUGHT.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-06-19

Quad Name: UPPER SLIDE LAKE Precision: S

*012 BAT SURVEY STATION
County: Teton Elevation: 2450M
Meridian: 6P Town/Range -Section: 041N112W -14 NE4 S14, SE4 S11
Location: GROS VENTRE RIVER DRAINAGE, SODA LAKE
EO Data: BAT SURVEY; USED BAT DETECTOR; FROM 2145-2225 HRS (.75 HRS TOTAL); HEARD 1 UNIDENTIFIED AND 2 LITTLE BROWN BATS; HABITATS INCLUDED OPEN WATER (30 ACRE LAKE), CLEARINGS (OPEN MEADOW AND SAGEBRUSH), FORESTED AREA (CONIFEROUS FOREST).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-06-21
Quad Name: BURNT MOUNTAIN Precision: S

*013 BAT SURVEY STATION
County: Teton Elevation: 2210M
Meridian: 6P Town/Range -Section: 042N114W -02 NW4
Location: GROS VENTRE RIVER VALLEY; AT HORSETAIL CREEK WHERE IT CROSSES USFS RD #30400, NORTH SIDE OF ROAD
EO Data: BAT SURVEY; AT HORSETAIL CREEK WHERE IT CROSSES USFS RD #30400, SET NET ACROSS CREEK ON NORTH SIDE OF ROAD; USED BAT DETECTOR AND MIST NET; FROM 2145-2300 HRS (1.25 HRS TOTAL); NONE HEARD OR CAPTURED; HABITATS INCLUDED: RIPARIAN (WILLOWS), OPEN WATER (SMALL CREEK 1.5 CFS), MEADOWS, JUNIPERS/ ASPENS.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-06-24
Quad Name: SHADOW MOUNTAIN Precision: S

*014 BAT SURVEY STATION
County: Lincoln Elevation: 2150M
Meridian: 6P Town/Range -Section: 036N118W -36 NW4SE4
Location: GREYS RIVER DRAINAGE; AT MURPHY CREEK ALONG USFS RD #10002
EO Data: BAT SURVEY; USED BAT DETECTOR AND MIST NET; SET MIST NET OVER SMALL BEAVER POND NEXT TO MURPHY CREEK IN WET SEDGE MEADOW; CAUGHT 1 HOARY BAT, RELEASED, MEASUREMENTS: MALE, NON-SCROTAL, TL: 129, TAIL: 46, HF: 10, EAR: 14, TRAGUS: 6, WT: 30 GM, FOREARM: 55, CAUGHT 3' OVER WATER, HISSED AND GAVE AUDIBLE DISTRESS CLICKS, PASSIVE, DID NOT GIVE ECHOLOCATION CALLS; ALSO HEARD ABOUT 11 LITTLE BROWN BATS AND 3 MYOTIS SPP., SLOWER THAN THE LATTER, BUT SAME FREQ.; HABITATS INCLUDED: OPEN WATER (CREEK, BEAVER POND), CLEARINGS (WET MEADOW), CONIFEROUS FOREST SURROUNDING MEADOW.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-05
Quad Name: DEER CREEK Precision: S

*015 BAT SURVEY STATION
County: Teton Elevation: 2100M
Meridian: 6P Town/Range -Section: 042N113W -16 S2NW4
Location: GROS VENTRE RIVER VALLEY; ON USFS RD #30400, WHERE IT CROSSES CRYSTAL CREEK (CRYSTAL CREEK BRIDGE)
EO Data: BAT SURVEY; USED MIST NET AND BAT DETECTOR; FROM 0920-1125 HRS (2 HRS TOTAL); SET NET ACROSS CRYSTAL CREEK, JUST DOWNSTREAM FROM BRIDGE; HABITATS INCLUDED: MANMADE STRUCTURE (BRIDGE), RIPARIAN (WILLOWS), OPEN WATER (CREEK), GRASSLANDS, SHRUBLANDS (SAGE); ABOUT 5 LITTLE BROWN BATS OBSERVED. ALSO CHECKED WITH BAT DETECTOR ON 20 JULY FROM 2220-2300 HRS (0.5 TOTAL) 3 UNID BATS HEARD, PEAK AT 40 KHZ, RANGE (NO GOOD READINGS) FROM 35-45 KHZ, LOUD AND SLOW (LIKE

HOARY BAT; POSSIBLY BIG BROWN BAT?); ALSO ANOTHER UNID BAT WITH A PEAK OF 38 KHZ, NO RANGE READING (SILVER-HAIRED BAT?); 1 LITTLE BROWN BAT. CHECKED AGAIN ON 22 JULY WITH BAT DETECTOR FROM 2150-2300 HRS (1.1 HRS TOTAL); ABOUT 6 LITTLE BROWN BATS IN AREA, FLYING 10-15' ABOVE CREEK, COULD HEAR RANGE OF 30-100 KHZ, PEAK 44 KHZ, MOST LATER FLYING AT WATER SURFACE, SOME WITHIN 1-2' OF ONE ANOTHER, FORAGE IN CIRCULAR ROUTES OVER SLOWER SECTIONS OF CREEK; HEARD UNID BAT 2150 HRS, PEAK AT 38 KHZ, RANGE 25-60 KHZ (SILVER-HAIRED BAT?); SECOND UNID BAT HEARD AT 2259 HRS, PEAK AT 44 KHZ FROM 20' DISTANT, FLEW FASTER THAN MYOTIS. CHECKED AGAIN ON 24 JULY FROM 2314-2335 HRS (.25 HRS TOTAL); ABOUT 5 LITTLE BROWN BATS WORKING AREA.

Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-25
Quad Name: GRIZZLY LAKE Precision: S

*016 BAT SURVEY STATION
County: Lincoln Elevation: 1900M
Meridian: 6P Town/Range -Section: 035N117W -09 NW4NW4
Location: GREYS RIVER DRAINAGE; AT CONFLUENCE OF GREYS RIVER AND LOST CREEK ALONG USFS RD #10138
EO Data: BAT SURVEY; USED MIST NET AND BAT DETECTOR; FROM 2145-2330 HRS (1.75 HRS TOTAL); SET MIST NET ACROSS GREYS RIVER (PORTION OF); HOARY BATS EMERGED AT 2150 HRS, COMMON, 2-5 WORKING IN AREA; COULD HEAR THEM UP TO 75' AWAY; FLYING ABOUT 70' OVER RIVER; PEAK ABOUT 26 KHZ; RANGE 22-40 KHZ; LAST HOARY BAT HEARD AT 2220 HRS, ALSO HEARD HIGH PITCHED SQUEAKS (FROM HOARY BATS?); ABOUT 4 LITTLE BROWN BATS IN AREA; RANGE 30-70 KHZ, PEAK AT 44 KHZ; ALSO HEARD AN UNIDENTIFIED BAT WITH A PEAK OF 40 KHZ AND A RANGE OF 30-50 KHZ AT ABOUT HALF THE RATE OF THE LITTLE BROWN BAT (BIG BROWN BAT?).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-06
Quad Name: DEER CREEK Precision: S

*017 BAT SURVEY STATION
County: Lincoln Elevation: 1900M
Meridian: 6P Town/Range -Section: 035N117W -09 NW4NW4
Location: GREYS RIVER DRAINAGE; AT MURPHY CREEK BRIDGE ON USFS RD #10002, NEAR CONFLUENCE OF MURPHY CREEK AND GREYS RIVER
EO Data: BAT SURVEY; USED BAT DETECTOR; FROM 2210-2300 HRS (1 HR TOTAL); ABOUT 3 LITTLE BROWN BATS IN AREA; HEARD UNID BAT AT 2131 WITH PEAK AT 40 KHZ WITH A RANGE OF 30-50 KHZ (HEARD 2 TIMES; BIG BROWN BAT?); ANOTHER UNID BAT WITH PEAK AT ABOUT 38 KHZ AND A RANGE OF 25-60 KHZ (SILVER-HAIRED BAT?); HABITAT INCLUDED: MANMADE STRUCTURE (BRIDGE), OPEN WATER (CREEK), CONIFEROUS FOREST AND RIPARIAN (WILLOWS)
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-07
Quad Name: DEER CREEK Precision: S

*018 BAT SURVEY STATION
County: Lincoln Elevation: 1850M
Meridian: 6P Town/Range -Section: 037N117W -27 SW4NW4
Location: GREYS RIVER DRAINAGE; ON USFS RD #10138, AT BRIDGE AT CONFLUENCE OF LITTLE GREYS RIVER AND GREYS RIVER
EO Data: BAT SURVEY; USED BAT DETECTOR , FROM 2315-2330 (.25 HRS); NONE HEARD; HABITAT INCLUDED: OPEN WATER (RIVER) AND CONIFEROUS FOREST.

Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-07
Quad Name: PINE CREEK Precision: S

*019 BAT SURVEY STATION
County: Lincoln Elevation: 1900M
Meridian: 6P Town/Range -Section: 036N117W -05 SE4NE4
Location: GREYS RIVER DRAINAGE; ON GREYS RIVER ABOUT 1/3 MI N OF DEAD DOG CREEK
EO Data: BAT SURVEY; USED MIST NET AND BAT DETECTOR FROM 2200-2330 HRS (1.5 HRS TOTAL); SET NET OVER OXBOW OF GREYS RIVER BY ROAD; HEARD HOARY BAT AT 2225 (2 PASSES); 3-5 LITTLE BROWN BATS IN AREA FLYING CLOSE TO WATERS SURFACE; ALSO HEARD UNID BAT WITH PEAK AT 40 KHZ, NO RANGE DATA; NONE CAPTURED; HABITATS INCLUDED: OPEN WATER (RIVER); GRAVEL BAR; RIPARIAN (WILLOWS AND WET SEDGE MEADOW).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-08
Quad Name: DEER CREEK Precision: S

*020 BAT SURVEY STATION
County: Teton Elevation: 2850M
Meridian: 6P Town/Range -Section: 042N112W -13 PORTIONS OF S 13,14,23,24,26,27,28 & 34 ALONG USFS RD
Location: GROS VENTRE RIVER DRAINAGE; SURVEYED ALONG USFS RD #30415 ALONG DRY COTTONWOOD CREEK FROM TOP NEAR GUNSIGHT PASS TO GROS VENTRE RIVER.
EO Data: BAT SURVEY; ROADSIDE SURVEY USING BAT DETECTOR; STOPPED AT 1 MILE INTERVALS AND LISTENED FOR 10 MINUTE INTERVALS; 6 STATIONS TOTAL; NO BATS HEARD; HABITATS INCLUDED SUBALPINE CONIFEROUS FOREST (STATIONS 1-3) AND SAGE (STATIONS 4-6). TYPANATE MOTHS COMMON AT START OF TRANSECT. SURVEY STARTED AT 2850M AND ENDED AT 2250M.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-16
Quad Name: BURNT MOUNTAIN Precision: M

*021 BAT SURVEY STATION
County: Teton Elevation: 2200M
Meridian: 6P Town/Range -Section: 042N113W -15 NW4SE4
Location: GROS VENTRE RIVER DRAINAGE; ALONG GROS VENTRE RIVER ALONG RIVER AT END OF SPUR ROAD OFF OF USFS RD #30400
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2130-2215 HRS (.75 HRS); ABOUT 6-9 LITTLE BROWN BATS WORKING AREA (SAW 6 AT ONCE), HEARD FIRST ONE AT 2140 HRS; HABITATS INCLUDED: RIPARIAN, CONIFEROUS FOREST, CLEARINGS (MEADOWS), SHRUBLAND (SAGE) AND CLIFFS.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-18
Quad Name: GRIZZLY LAKE Precision: S

*022 BAT SURVEY STATION
County: Teton Elevation: 2200M
Meridian: 6P Town/Range -Section: 042N112W -19 SW4SE4
Location: GROS VENTRE RIVER DRAINAGE; ALONG SW EDGE OF UPPER SLIDE LAKE; SURVEYED ALONG SHORT SPUR ROAD OFF OF USFS RD #30400 TO LAKE AND BACK
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2235-2305 HRS (0.5 HRS TOTAL); HEARD ONE UNIDENTIFIED BAT; HABITATS INCLUDED: OPEN WATER (LAKE) AND CLEARINGS (MEADOWS).

Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-18
Quad Name: UPPER SLIDE LAKE Precision: S

*023 BAT SURVEY STATION
County: Teton Elevation: 2150M
Meridian: 6P Town/Range -Section: 042N113W -23 NE4NW4
Location: GROS VENTRE RIVER DRAINAGE; ALONG ALKALI CREEK, A TRIBUTARY OF THE GROS VENTRE; JUST N OF USFS RD #30400
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2130-2200 HRS (0.5 HRS TOTAL); HEARD ABOUT 2 LITTLE BROWN BATS; AND UNID BAT WITH PEAK AT 38 KHZ AND RANGE OF ABOUT 25-60 KHZ- FLEW SLOWER THAN LITTLE BROWN BAT WITH A MORE DIRECT FLIGHT ABOUT 20' OVER GROUND, COULD DETECT FROM ~50' DISTANT (SILVER-HAIRED BAT?); HABITATS INCLUDED: RIPARIAN (BEAVER PONDS/ CREEK AND WET MEADOW), OPEN WATER (BEAVER POND), CLEARINGS (WET MEADOW), FORESTED AREA (SCATTERED DOUGLAS FIR AND ASPENS).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-19
Quad Name: GRIZZLY LAKE Precision: S

*024 BAT SURVEY STATION
County: Teton Elevation: 2150M
Meridian: 6P Town/Range -Section: 042N113W -18 NE4NE4
Location: GROS VENTRE RIVER AT BRIDGE CROSSING RIVER ON USFS RD #30400
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2224-2234 HRS (0.1 HRS TOTAL); NONE HEARD; HABITATS INCLUDED: MANMADE STRUCTURE (BRIDGE), OPEN WATER (RIVER), SHRUBLAND (SAGE) AND CONIFEROUS FOREST (SPRUCE AND FIR). CHECKED AGAIN ALONG ROAD RUNNING N ALONG RIVER, ON W SIDE OF RIVER, DOWN TO BRIDGE; CHECKED WITH BAT DETECTOR FROM 2208-2308 HRS (1 HR TOTAL); HEARD UNID BAT AT 2220 HRS WITH PEAK AT 38 KHZ AND RANGE OF 30-50 KHZ, SLOW LIKE HOARY BAT CALLS (SILVER-HAIRED BAT?); RECORDED ABOUT 21 PASSES BY MYOTIS, PROBABLY MOSTLY LITTLE BROWN BATS.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-19
Quad Name: GRIZZLY LAKE Precision: S

*025 BAT SURVEY STATION
County: Teton Elevation: 2150M
Meridian: 6P Town/Range -Section: 042N113W -23 NW4NE4
Location: GROS VENTRE RIVER; ALONG RIVER FLOODPLAIN BY RIVER; JUST N OF USFS RD #30400
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2140-2210 HRS (0.5 HRS TOTAL); HEARD ONE HOARY BAT AT 2140 HRS; HEARD ONE LITTLE BROWN BAT AT 2142 HRS; HABITATS INCLUDED: RIPARIAN, OPEN WATER (BEAVER PONDS, RIVER); FORESTED AREA (CONIFERS) AND CLIFFS.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-20
Quad Name: GRIZZLY LAKE Precision: S

*026 BAT SURVEY STATION
County: Teton Elevation: 2250M
Meridian: 6P Town/Range -Section: 042N112W -29 SE4NW4
Location: GROS VENTRE RIVER DRAINAGE; VICINITY OF RIVER AND UPPER SLIDE LAKE
EO Data: BAT SURVEY; CHECKED ALONG GROS VENTRE RIVER AND AT SMALL (1 ACRE) LAKE JUST SOUTH OF RIVER; USED BAT DETECTOR; AT RIVER: CHECKED FROM 2130-2205 HRS (0.5 HRS TOTAL); HEARD 1 UNID BAT

WITH PEAK AT 38 KHZ AND RANGE ABOUT 35-50 KHZ (NOT A GOOD READING) HEARD AT 2159 (SILVER-HAIRED BAT?); ALSO HEARD ONE LITTLE BROWN BAT; AT LAKE: START AT 2213-2236 HRS (0.5 HRS TOTAL); ABOUT 4 LITTLE BROWN BATS OBSERVED FORAGING ON LAKE, MIST ON LAKE, ALSO HEARD 1 UNID BAT WITH PEAK AT 38 KHZ (SILVER-HAIRED BAT?); HABITATS INCLUDED: RIPARIAN (WILLOWS, SEDGE MEADOWS), OPEN WATER (LAKE, RIVER), AND CLEARINGS (MEADOWS).

Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-23
Quad Name: UPPER SLIDE LAKE Precision: S

*027 BAT SURVEY STATION
County: Sublette Elevation: 2350M
Meridian: 6P Town/Range -Section: 035N109W -19 SE4NW4
Location: GREEN RIVER DRAINAGE; WILLOW LAKE, AT SOUTH END AT OUTLET/DAM
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2130-2300 HRS (1.5 HRS TOTAL); 3-4 LITTLE BROWN BATS OBSERVED FORAGING 5-30' ABOVE A DRY CREEK BED ADJACENT TO RUNNING CREEK/ OUTLET OF WILLOW LAKE; CADDISFLIES AND MOTHS OBSERVED IN SAME AREA; HABITATS INCLUDED: MANMADE STRUCTURE (SMALL DAM), RIPARIAN (WILLOWS, FIRS), SHRUBLAND (SAGE/ GRASS).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-08-02
Quad Name: CORA Precision: S

*028 BAT SURVEY STATION
County: Sublette Elevation: 2450M
Meridian: 6P Town/Range -Section: 039N109W -13 NE4SW4
Location: GREEN RIVER DRAINAGE, GREEN RIVER LAKES AREA, ABOUT 2 MI DOWNSTREAM FROM LAKES ALONG RIVER N OF USFS RD #091
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2110-2150 HRS (~0.5 HRS TOTAL); HEARD FIRST LITTLE BROWN BAT AT 2112, HEARD 11 PASSES TOTAL; HEARD ONE HOARY BAT AT 2116; HABITATS INCLUDED: OPEN WATER (RIVER); CLIFFS, SHRUBLAND (SAGE) AND CLEARINGS (OPEN WET SEDGE MEADOW), ALSO, FORESTED AREAS (PRIMARILY CONIFERS).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-08-03
Quad Name: GREEN RIVER LAKES Precision: S

*029 BAT SURVEY STATION
County: Sublette Elevation: 2400M
Meridian: 6P Town/Range -Section: 038N110W -02 SW4
Location: GREEN RIVER DRAINAGE, KENDALL WARM SPRINGS, ALONG USFS RD #091
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2125-2155 HRS (~0.5 HRS TOTAL); ONE UNIDENTIFIED BAT HEARD, DID NOT GET A GOOD READING; WALKED ALONG ENTIRE LENGTH OF WARM SPRINGS TO RIVER; HABITATS INCLUDED: OPEN WATER (WARM SPRINGS) AND CLEARINGS (WET SEDGE MEADOW). ABOUT .2MI AWAY); CLIFFS, SHRUBLAND (SAGE) AND CLEARINGS (OPEN WET SEDGE MEADOW), ALSO, FORESTED AREAS (PRIMARILY LODGEPOLE PINE). ALSO WALKED ALONG GREEN RIVER UPSTREAM FROM WARMSPRINGS CONFLUENCE AND LISTENED WITH BAT DETECTOR FROM 2200-2215 HRS (.25 HRS TOTAL); HEARD ONE UNID BAT WITH PEAK ABOUT 38 KHZ, DID NOT GET A GOOD READING (SILVER-HAIRED BAT?).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-08-04
Quad Name: KLONDIKE HILL Precision: S

*030 BAT SURVEY STATION

County: Sublette Elevation: 2650M

Meridian: 6P Town/Range -Section: 031N104W -28 PORTIONS OF S 28 & 33 ALONG USFS RD

Location: WIND RIVER RANGE, BIG SANDY RIVER AREA; ALONG USFS RD #299

EO Data: BAT SURVEY; USED BAT DETECTOR TO LISTEN DURING ROAD TRANSECT; 0.5 MI STOPS, LISTENED FOR 10 MIN; STARTED AT BORDER OF USFS LANDS AND HEADED N ON USFS RD #299 NEAR DUTCH JOE GUARD STATION; STARTED AT 2215 AND ENDED AT 2317 HRS (1 HR TOTAL); NO BATS HEARD EXCEPT AT STATION 1, WHERE 1 UNID MYOTIS WAS HEARD; 5 STATIONS TOTAL; HABITATS INCLUDED: RIPARIAN (WILLOWS, CONIFERS, GRASSES), OPEN WATER (CREEK); FORESTED AREA (CONIFERS, ASPENS), AND SHRUBLAND (SAGE).

Management Unit: BRIDGER-TETON NATIONAL FOREST

Date Last surveyed: 1991-08-06

Quad Name: TEMPLE PEAK Precision: M

*031 BAT SURVEY STATION

County: Sublette Elevation: 2500M

Meridian: 6P Town/Range -Section: 030N102W -32 SW4SW4

Location: WIND RIVER RANGE AREA; SWEETWATER RIVER DRAINAGE; ALONG SWEETWATER RIVER AT BIG SANDY CAMPGROUND

EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2149-2220 HRS (~0.5 HRS TOTAL); NONE HEARD; HABITATS INCLUDED: RIPARIAN (WILLOWS, GRASSES), OPEN WATER (CREEK) AND FORESTED AREAS (CONIFERS). CHECKED GENERAL AREA AGAIN ON 8 AUGUST USING BAT DETECTOR FROM 2250-2310 HRS (0.5 HRS); NONE HEARD.

Management Unit: BRIDGER-TETON NATIONAL FOREST

Date Last surveyed: 1991-08-07

Quad Name: SWEETWATER NEEDLES Precision: S

*032 BAT SURVEY STATION

County: Teton Elevation: 2250M

Meridian: 6P Town/Range -Section: 044N118W -21 SEC ALONG USFS RD: R118W- S21,22,23,24; R117W- S19,20

Location: TETON CANYON CREEK; SURVEYED ALONG ALL OF USFS RD #009

EO Data: BAT SURVEY; USED BAT DETECTOR FOR ROAD TRANSECT; STOPPED AT 0.5 MI INTERVALS AND LISTENED FOR 10 MIN; STARTED AT TETON CANYON CAMPGROUND AND HEADED WEST; STARTED AT 2110-2312 HRS (2 HRS TOTAL); 8 STATIONS TOTAL; STATION 1: 2 UNID BATS, MYOTIS? AND 1 HOARY BAT?, LATTER FLYING ABOUT 125' UP IN AIR; STATION 2; NONE HEARD; STATION 3: UNID BAT WITH PEAK AT 38 KHZ, LITTLE FASTER THAN HOARY BAT (SILVER-HAIRED BAT?); STATION 4: 8 HOARY BAT PASSES, FREQ RANGE 20-75 KHZ; STATION 5: 3 LITTLE BROWN BATS AND 1 HOARY BAT PASS; STATION 6: 3 LITTLE BROWN BAT PASSES; STATION 7: 1 MYOTIS, 1 UNID BAT; STATION 8: NONE HEARD; STATION 9: 11 PASSES BY MYOTIS, 1 UNID BAT; HABITATS INCLUDED: RIPARIAN (WILLOWS, CONIFERS), OPEN WATER (CREEK), CLEARINGS (MEADOWS), SHRUBLAND (SAGE), CLIFFS AND FORESTED AREAS. ALSO SURVEYED AGAIN WITH BAT DETECTOR/ TRANSECT ON 3 SEPT FROM 2106-2258 HRS (~2 HRS TOTAL); 8 STATIONS; STATION 1: 1 LITTLE BROWN BAT AND 4 UNID OTHERS (PROB SAME); STATION 2: 1 UNID BAT; STATION 3: 5 UNID BATS, 1 LITTLE BROWN BAT; STATION 4; NONE; STATION 5: NONE; STATION 6: NONE; STATION 7: 1 UNID; STATION 8: NONE. (MAINLY LODGEPOLE PINE, DOUGLAS FIR, SOME ASPEN, MOUNTAIN MAHOGANY); NOTED MANY MOTHS ALONG ROAD.

Management Unit: TARGHEE NATIONAL FOREST

Date Last surveyed: 1991-08-08

Quad Name: GRANITE BASIN Precision: S

*033 BAT SURVEY STATION
County: Teton Elevation: 2260M
Meridian: 6P Town/Range -Section: 044N118W -30 NW4NW4
Location: TETON CANYON CREEK; JUST SOUTH OF USFS RD #009; ON CREEK
EO Data: BAT SURVEY; USED BAT DETECTOR AND SET UP MIST NET; STARTED AT 2030-2230 HRS (2 HRS TOTAL); CAUGHT 3 LITTLE BROWN BATS, KEPT 1 AS SPECIMEN; HEARD FIRST ONE AT 2105, FREQ RANGE 31-90 KHZ, PEAK AT 44 KHZ; MOST FLYING 10-40' UP; CAUGHT 1 AT 2120 AND 2 AT 2220 HRS; ACTIVITY WAS GREATEST AT TWILIGHT; HABITATS INCLUDED; RIPARIAN (DOUGLAS FIR, WILLOWS), OPEN WATER (CREEK) AND FORESTED (DOUGLAS FIR).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-17
Quad Name: GRANITE BASIN Precision: S

*034 BAT SURVEY STATION
County: Teton Elevation: 1905M
Meridian: 6P Town/Range -Section: 038N116W -08 NW4SW4
Location: SNAKE RIVER,"GRAND CANYON" OF SNAKE RIVER ON N SIDE OF RIVER ON HWY 26/89
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2145-2200 (0.25 HRS TOTAL) AT THIS STATION; 5 LITTLE BROWN BAT PASSES HEARD; HABITATS INCLUDED: OPEN WATER (RIVER), RIPARIAN (WILLOWS).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-18
Quad Name: MUNGER MOUNTAIN Precision: S

*035 BAT SURVEY STATION
County: Teton Elevation: 1905M
Meridian: 6P Town/Range -Section: 038N116W -17 SE4SE4
Location: SNAKE RIVER,"GRAND CANYON" OF SNAKE RIVER ON N SIDE OF RIVER ON HWY 26/89
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2110-2125 (0.25 HRS TOTAL) AT THIS STATION; 2 UNID BATS HEARD; HABITATS INCLUDED: OPEN WATER (RIVER), RIPARIAN (WILLOWS).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-18
Quad Name: MUNGER MOUNTAIN Precision: S

*036 BAT SURVEY STATION
County: Teton Elevation: 1905M
Meridian: 6P Town/Range -Section: 038N116W -29 NE4NE4
Location: SNAKE RIVER,"GRAND CANYON" OF SNAKE RIVER ON N SIDE OF RIVER ON HWY 26/89
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2131-2146 (0.25 HRS TOTAL) AT THIS STATION; 3 HOARY BAT PASSES AND 2 LITTLE BROWN BAT PASSES; HABITATS INCLUDED: OPEN WATER (RIVER), CLIFFS (TALUS SLOPE) AND A FEW DOUGLAS FIR SNAGS.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-18
Quad Name: PINE CREEK Precision: S

*037 BAT SURVEY STATION
County: Teton Elevation: 1905M
Meridian: 6P Town/Range -Section: 038N116W -29 SW4SW4
Location: SNAKE RIVER,"GRAND CANYON" OF SNAKE RIVER ON N SIDE OF RIVER ON HWY 26/89
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2253-2308 (0.25 HRS

TOTAL) AT THIS STATION; 3 HOARY BAT PASSES, 1 LITTLE BROWN BAT PASSES AND 1 UNID BAT PASS; HABITATS INCLUDED: OPEN WATER (RIVER), FORESTED AREAS (SCATTERED JUNIPER AND DOUGLAS FIR), GRASSLAND, SHRUBLAND (SAGE) AND GRAVEL BARS ALONG RIVER

Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-18
Quad Name: PINE CREEK Precision: S

*038 BAT SURVEY STATION
County: Teton Elevation: 1905M
Meridian: 6P Town/Range -Section: 038N116W -29 SW4SW4
Location: SNAKE RIVER,"GRAND CANYON" OF SNAKE RIVER ON N SIDE OF RIVER ON HWY 26/89 AT ELBOW CAMPGROUND
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2315-2330 (0.25 HRS TOTAL) AT THIS SIATION; 1 HOARY BAT PASS, 1 LITTLE BROWN BAT PASS AND 4 UNID BAT PASSES; HABITATS INCLUDED: OPEN WATER (RIVER), FORESTED AREAS (DOUGLAS FIR), AND GRAVEL BARS ALONG RIVER.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-18
Quad Name: PINE CREEK Precision: S

*039 BAT SURVEY STATION
County: Teton Elevation: 1905M
Meridian: 6P Town/Range -Section: 037N117W -05 NE4NE4
Location: SNAKE RIVER,"GRAND CANYON" OF SNAKE RIVER ON N SIDE OF RIVER ON HWY 26/89
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2336-2351 (0.25 HRS TOTAL) AT THIS STATION; 1 UNID BAT PASS; HABITATS INCLUDED: OPEN WATER (RIVER), FORESTED AREAS (SCATTERED JUNIPER AND DOUGLAS FIR), CLEARINGS (MEADOWS), GRASSLAND AND SHRUBLAND (SAGE).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-18
Quad Name: PINE CREEK Precision: S

*040 BAT SURVEY STATION
County: Sublette Elevation: 2245M
Meridian: 6P Town/Range -Section: 003N107W -03 SEC ALONG USFS RD: 3,7,8, & 9
Location: BOULDER LAKE; SURVEYED ALONG USFS RD 10-104 FROM S BORDER OF USFS LANDS TO NE ALONG S SIDE OF BOULDER LAKE
EO Data: BAT SURVEY; USED BAT DETECTOR ALONG ROAD SURVEY ROUT; STOPPED AT 0.5 MI INTERVALS AND LISTENED FOR 10 MIN; 6 STATIONS TOTAL; START 2156-2323 (-1.5 HRS TOTAL); STATION 1: NONE HEARD, HABITAT: SHRUBLAND (SAGE); STATION 2: SAME HABITAT, NONE HEARD; STATION 3: SAME HABITAT, 1 UNID BAT HEARD; STATION 4: 1 UNID BAT HEARD, SLOW/MED SPEED CLICKS, PEAK AT 34 KHZ, RANGE- -25-45+ KHZ (SILVER-HAIRED BAT?, FRINGED MYOTIS ? (SUPPOSEDLY OUT OF RANGE)); HABITATS INCLUDED: SHRUBLAND (SAGE) AND FORESTED (SCATTERED ASPENS); STATION 5: 5 UNID BAT PASSES (SAME SPP AS STATION #4?), AND 1 LITTLE BROWN BAT; HABITATS INCLUDED: SAME AS #4 BUT DENSER ASPENS/ SAGE AND A FEW CONIFERS; STATION 6: SAME HABITAT, NONE HEARD.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-08-19
Quad Name: BOULDER LAKE Precision: S

*041 BAT SURVEY STATION

County: Teton Elevation: 2240M
Meridian: 6P Town/Range -Section: 043N118W -22 NW4NE4
Location: DARBY CANYON ALONG DARBY CREEK JUST DOWNSTREAM OF CONFLUENCE WITH TERRACE CREEK, SOUTH OF USFS RD #012
EO Data: BAT SURVEY; SURVEYED AT STATION NEXT TO CREEK WITH BAT DETECTOR FROM 2045-2145 HRS (1 HR TOTAL); 1 UNID BAT, 10 PASSES BY ANOTHER UNID BAT WITH PEAK AT ~38 KHZ AND RANGE OF 30-60 KHZ, LONG CALLS ~15 MS (SILVER-HAIRED BATS?); BAT ACTIVITY PEAKED AT 2110 HRS; ALSO HEARD 1 LITTLE BROWN BAT; HABITATS INCLUDED RIPARIAN (WILLOWS), OPEN WATER (CREEK), CLEARINGS (5 AC MEADOW), FORESTED AREA (SPRUCE AND SOME ASPEN).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-30
Quad Name: MOUNT BANNON Precision: S

*042 BAT SURVEY STATION
County: Teton Elevation: 2790M
Meridian: 6P Town/Range -Section: 043N118W -23 SW4SW4
Location: DARBY CANYON AREA; CAVE ALONG TERRACE CREEK, SOUTH OF USFS RD #012
EO Data: BAT SURVEY; CHECKED SMALL LIMESTONE CAVE ON TERRACE CREEK FOR BATS, LOWER CAVE (JUST EAST OF WATERFALL) NOT VERY LARGE; , NO BATS OR BAT SIGN FOUND.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-09-30
Quad Name: MOUNT BANNON Precision: S

*043 BAT SURVEY STATION
County: Teton Elevation: 2820M
Meridian: 6P Town/Range -Section: 043N118W -28 NW4NW4
Location: DARBY CANYON AREA; CAVE ALONG TERRACE CREEK, SOUTH OF USFS RD #012
EO Data: BAT SURVEY; CHECKED SMALL LIMESTONE CAVE ON TERRACE CREEK FOR BATS, UPPER (JUST EAST OF CREEK BED); SUITABLE CAVE (DARK IN REAR, ETC); NO BATS OR BAT SIGN FOUND.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-09-30
Quad Name: MOUNT BANNON Precision: S

*044 BAT SURVEY STATION
County: Teton Elevation: 2200M
Meridian: 6P Town/Range -Section: 043N118W -19 SEC ALONG USFS RD; S 19,20,21, & 22
Location: DARBY CANYON AREA; SURVEYED ALONG USFS RD #012 ALONG DARBY CREEK FROM WESTERN USFS BOUNDARY AT START OF ROAD AND CONTINUED TO EAST.
EO Data: BAT SURVEY; SURVEYED ALONG USFS RD #012 STOPPING AT 0.5 MI INTERVALS AND LISTENING FOR 10 MIN; START 2045-2203 HRS (1.25 HRS TOTAL); 6 STATIONS TOTAL; STATION 1: 1 UNID, 1 UNID WITH PEAK AT 35 KHZ; (SILVER-HAIRED BAT?, FRINGED MYOTIS?- SUPPOSEDLY OUT OF RANGE) STATION 2: 4 PASSES BY LITTLE BROWN BAT; STATION 3; 3 UNID, 2 UNID WITH PEAK AT 35 KHZ; STATION 4; 4 UNID, 6 LITTLE BROWN BAT PASSES; 1 UNID WITH PEAK AT 35 KHZ (SILVER-HAIRED BAT?, FRINGED MYOTIS?- SUPPOSEDLY OUT OF RANGE); STATION 5; 1 UNID, 1 UNID WITH PEAK AT 35 KHZ (SILVER-HAIRED BAT?, FRINGED MYOTIS?- SUPPOSEDLY OUT OF RANGE) ; 3 LITTLE BROWN BAT PASSES; STATION 6: 3 LITTLE BROWN BAT PASSES; 2 UNID WITH PEAK AT 35 KHZ, (SILVER-HAIRED BAT?, FRINGED MYOTIS?- SUPPOSEDLY OUT OF RANGE) ; AND 2 UNID BATS; HABITATS INCLUDED: RIPARIAN, OPEN WATER (CREEK), CLEARINGS (MEADOWS) CLIFFS, AND FORESTED

(CONIFERS AND ASPENS).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-31
Quad Name: MOUNT BANNON Precision: M

*045 BAT SURVEY STATION
County: Teton Elevation: 2240M
Meridian: 6P Town/Range -Section: 043N118W -19 SEC ALONG USFS RD; S 14,15,19,20,21,22
Location: DARBY CANYON AREA; SURVEYED ALONG USFS RD #012 ALONG DARBY CREEK; ENTIRE ROAD FROM END TO USFS BOUNDARY
EO Data: BAT SURVEY; SURVEYED ALONG USFS RD #012 STOPPING AT 0.5 MI INTERVALS AND LISTENING FOR 10 MIN; START 2042-2304 HRS (~2.25 HRS TOTAL); 10 STATIONS TOTAL; STATION 1: 4 UNID BAT PASSES, 1 PEAK AT 40 KHZ AND ANOTHER AT 35 KHZ, BUT RAPID; 7 PASSES BY LITTLE BROWN BATS, ABOUT 1-3 BATS FLYING ABOUT 30 UP IN AIR; STATION 2; 1 UNID; STATION 3: NONE HEARD; STATION 4; 1 LITTLE BROWN BAT; STATION 5: 3 LITTLE BROWN BATS; STATION 6: 10 LITTLE BROWN BATS AND 2 WITH PEAKS AT 40 KHZ, PROBABLY THE SAME (?) AND 8 UNID BAT PASSES; STATION 7: 4 LITTLE BROWN BATS AND 2 UNID; STATION 8: NONE HEARD; STATION 9: 2 UNID AND 1 PEAK AT 35 KHZ; STATION 10; NONE HEARD; HABITATS SAME AS #044.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-09-01
Quad Name: MOUNT BANNON Precision: M

*046 BAT SURVEY STATION
County: Teton Elevation: 2215M
Meridian: 6P Town/Range -Section: 043N118W -22 SW4NW4
Location: DARBY CANYON AREA; ALONG USFS RD #012 SET MIST NET ALONG DARBY CREEK WHERE BRIDGE CROSSES CREEK
EO Data: BAT SURVEY; SET MIST NET ACROSS CREEK 50' FROM/ DOWNSTREAM OF BRIDGE, NET CROSSED ALL OF CREEK; SET NET FROM 2030-2300; LITTLE BROWN BATS EMERGED AT 2025; CAUGHT 1 MALE LITTLE BROWN BAT AT 2130 (RELEASED), NON SCROTAL; ABOUT 4-6 WORKING THE AREA FORAGING ABOUT 5-25' ABOVE CREEK; ONE CAUGHT IN NET WAS 7' OVER WATER; ACTIVITY STOPPED BY 2300 HRS; HABITATS INCLUDED: MANMADE STRUCTURE (BRIDGE), RIPARIAN, OPEN WATER (CREEK), AND FORESTED AREA (SPRUCE AND FIR).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-09-01
Quad Name: MOUNT BANNON Precision: M

*047 BAT SURVEY STATION
County: Teton Elevation: 2225M
Meridian: 6P Town/Range -Section: 042N118W -32 NW4NW4
Location: MOOSE CREEK; AT END OF USFS RD #276 NEAR USFS CAMPGROUND
EO Data: BAT SURVEY; SET MIST NET ACROSS (ALL OF) MOOSE CREEK; ALSO USED BAT DETECTOR; FROM 2030-2245 HRS (~1.25 HRS TOTAL); NO BATS CAPTURED; 5 UNID BAT PASSES AND 2 UNID BATS WITH PEAK OF 35 KHZ AND RANGE OF 25-60 KHZ (SILVER-HAIRED BAT?); ALSO 8 PASSES BY LITTLE BROWN BATS (ABOUT 2-3 BATS); ALSO 1 PASS BY HOARY BAT AT 2157; HABITATS INCLUDED: RIPARIAN (WILLOWS, GRASSES, ETC.), OPEN WATER (CREEK), AND FORESTED AREAS (ASPEN, LODGEPOLE PINE AND SPRUCE).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-09-05
Quad Name: VICTOR Precision: S

*048 BAT SURVEY STATION

County: Teton Elevation: 2115M
Meridian: 6P Town/Range -Section: 047N118W -04 NW4SW4
Location: INDIAN LAKE; ALONG USFS RD #261
EO Data: BAT SURVEY; LISTENED AT STATION FROM 2035-2055 HRS (~.25 HRS); NONE HEARD; HABITATS INCLUDED: OPEN WATER (LAKE) AND FORESTED AREAS (LODGEPOLE PINE).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-06-08
Quad Name: INDIAN LAKE Precision: S

*049 BAT SURVEY STATION
County: Teton Elevation: 2115M
Meridian: 6P Town/Range -Section: 047N118W -04 SW4NE4
Location: SOUTH BOONE CREEK WHERE USFS RD #261 CROSSES
EO Data: BAT SURVEY; LISTENED AT STATION FROM 2110-2135 HRS (~.25 HRS); HABITATS INCLUDED: OPEN WATER (CREEK) AND FORESTED AREAS (LODGEPOLE PINE/ SNAGS). 4 PASSES BY HOARY BATS, RANGE 25-60 KHZ; 6 PASSES BY UNID BATS; 9 PASSES BY LITTLE BROWN BATS.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-06-08
Quad Name: INDIAN LAKE Precision: S

*050 BAT SURVEY STATION
County: Teton Elevation: 2120M
Meridian: 6P Town/Range -Section: 048N118W -25 SW4SW4
Location: MIDDLE BOONE CREEK, WHERE USFS RD #261 CROSSES
EO Data: BAT SURVEY; LISTENED AT STATION FROM 2130-2150 HRS (~.25 HRS); 2 PASSES BY LITTLE BROWN BAT; HABITATS INCLUDED: OPEN WATER (CREEK), RIPARIAN (WILLOWS), CLEARINGS (MEADOWS) AND FORESTED AREAS (LODGEPOLE PINE/ SNAGS). ALSO SET MIST NET ACROSS CREEK, JUST N OF RD ON 8 AUGUST; FROM 2030-2145 HRS (1.25 HRS TOTAL); NONE CAUGHT; ALSO LISTENED WITH BAT DETECTOR, HEARD 1 HOARY BAT AND OBSERVED ABOUT 3 LITTLE BROWN BATS IN AREA.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-06-08
Quad Name: HOMINY PEAK Precision: S

*051 BAT SURVEY STATION
County: Teton Elevation: 2125M
Meridian: 6P Town/Range -Section: 048N117W -19 NW4SE4
Location: NORTH BOONE CREEK, WHERE USFS RD #261 CROSSES
EO Data: BAT SURVEY; LISTENED AT STATION FROM 2200-2220 HRS (~.25 HRS); 1 PASS BY LITTLE BROWN BAT; 2 BY HOARY BAT, 7 BY UNID BATS; HABITATS INCLUDED: OPEN WATER (CREEK), RIPARIAN (WILLOWS), CLEARINGS (MEADOWS) AND FORESTED AREAS (LODGEPOLE PINE, SPRUCE).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-06-08
Quad Name: HOMINY PEAK Precision: S

*052 BAT SURVEY STATION
County: Teton Elevation: 2360M
Meridian: 6P Town/Range -Section: 048N117W -15 SW4NW4
Location: CALF CREEK, WHERE USFS RD #261 CROSSES
EO Data: BAT SURVEY; LISTENED AT STATION FROM 2244-2313 HRS (~0.5 HRS); 1 PASS BY LITTLE BROWN BAT; 2 UNID BATS AND 2 BY HOARY BATS; HABITATS INCLUDED: OPEN WATER (CREEK), RIPARIAN (WILLOWS), CLEARINGS (MEADOWS) AND FORESTED AREAS (LODGEPOLE PINE, SPRUCE).

Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-06-08
Quad Name: MCDONALD RESERVOIR Precision: S

*053 BAT SURVEY STATION
County: Teton Elevation:
Meridian: 6P Town/Range -Section: 047N118W -14 PORTIONS ALONG USFS RD; S14,15,16,17
Location: SURVEYED ALONG USFS RD #264; ERNST LAKE/ JACKASS MEADOW AREA
EO Data: BAT SURVEY; USED BAT DETECTOR FOR ROADSIDE SURVEY FROM 2144-2312 HRS (~1.5 HRS TOTAL); STOPPED EVERY 0.5 MI AND LISTENED FOR 10 MIN; 7 STATIONS TOTAL; NO BATS HEARD ON TRANSECT; HABITAT INCLUDED: FORESTED (LODGEPOLE PINE, SECOND GROWTH AND ASPEN); OPEN WATER (POND) AND CLEARINGS.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-09-24
Quad Name: SHEEP FALLS Precision: M

*054 BAT SURVEY STATION
County: Teton Elevation: 3035M
Meridian: 6P Town/Range -Section: 038N108W -03 SE4NE4NE4
Location: GREEN RIVER LAKES AREA; W SIDE OF FLAT TOP MOUNTAIN
EO Data: BAT SURVEY; 2 SMALL CAVES DISCOVERED AND SURVEYED BY D. HORNING AND H. MARRIOTT; NO BATS OBSERVED, NO SIGN OF BATS
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-08-14
Quad Name: GREEN RIVER LAKES Precision: S

*055 BAT SURVEY STATION
County: Teton Elevation:
Meridian: 6P Town/Range -Section: 047N118W -27 PORTIONS ALONG USFS RD; S27,28,29,32
Location: SURVEYED ALONG USFS RD #266; SWANER CREEK AREA
EO Data: BAT SURVEY; USED BAT DETECTOR FOR ROADSIDE SURVEY FROM 2144-2312 HRS (~1.5 HRS TOTAL); STOPPED EVERY 0.5 MI AND LISTENED FOR 10 MIN; 6 STATIONS TOTAL; NO BATS HEARD ON TRANSECT; HABITAT INCLUDED: FORESTED (LODGEPOLE PINE, SECOND GROWTH AND ASPEN); OPEN WATER (CREEK) AND CLEARINGS.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-09-24
Quad Name: Precision: M

*056 BAT SURVEY STATION
County: Sublette Elevation: 2650M
Meridian: 6P Town/Range -Section: 031N104W -05 SW4
Location: WIND RIVER RANGE, BIG SANDY RIVER AREA; ALONG USFS RD #135 OFF OF USFS RD #299; ALONG HEADWATERS OF BIG SANDY CREEK
EO Data: BAT SURVEY; USED BAT DETECTOR TO LISTEN WHILE WALKING ALONG CREEK; NO BATS HEARD; HABITATS INCLUDED: RIPARIAN (WILLOWS, CONIFERS, GRASSES), OPEN WATER (CREEK); FORESTED AREA (CONIFERS, ASPENS), AND SHRUBLAND (SAGE).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-08-05
Quad Name: TEMPLE PEAK Precision: M

APPENDIX 4: LISTING OF LOCATIONS WHERE HOARY BATS WERE DETECTED

Note: Numbers listed below corespond to map in Figure 2.

*010 BAT SURVEY STATION
County: Teton Elevation: 2410M
Meridian: 6P Town/Range -Section: 042N113W -24 SW4SE4
Location: GROSE VENTRE RIVER DRAINAGE; AT GOOSE LAKE
EO Data: BAT SURVEY; USED BAT DETECTOR AND MIST NET; FROM 2130-2315 HRS (1.75 HRS); HOARY BAT- ABOUT 4 OBSERVED, FREQUENCY RANGE 20-40 KHZ, PEAK AT 25 KHZ, DETECTABLE DISTANCE ABOUT 50', SLOW, LOUD PUTTLIKE CALLS, LARGE BAT FLIES ABOUT 15-40' ABOVE WATER, EMERGED BEFORE LITTLE BROWN BAT, AT DUSK, ABOUT 2145 HRS; LITTLE BROWN BAT EMERGED ABOUT 15 MIN LATER; SLOW FLIGHT, HIGHLY MANOUVERABLE, SOMETIMES SPEEDS UP IN FLIGHT; LEFT ABOUT 1/2 HR AFTER ARRIVAL. LITTLE BROWN BAT; FREQUENCY RANGE? TO 100 KHZ, PEAK AT 44 KHZ, DETECTABLE DISTANCE 25', RAPID PUTTS, SPEEDING UP TO FUZZY SOUND WHEN CLOSING IN ON AN INSECT, EMERGES JUST AFTER DUSK (ABOUT 2130-2150 IN JUNE), FLIES QUICK AND LOW OVER WATER- FROM WATER LEVEL TO 5' ABOVE WATER, USUALLY 1-2' ABOVE WATER, USUALLY FORAGE FOR ABOUT 2 HRS AND THEN LEAVE AREA. HEARD ABOUT 5 AND CAUGHT 2- RELEASED, NOT MEASURED. ALSO SURVEYED AGAIN ON 20 JUNE; USED MIST NET AND BAT DETECTOR; FROM 2130-2330 HRS (2 HRS TOTAL); ABOUT 10 LITTLE BROWN BATS OBSERVED; ABOUT 3 UNIDENT BATS OBSERVED AGEIN (SAME AS ABOVE), THESE LEFT SHORTLY AFTER ARRIVING. CHECKED AGAIN ON 10 JULY, NOT AS MANY BATS, ONLY HEARD 2 LITTLE BROWN BATS FROM 2200-2230 HRS (0.5 HRS TOTAL).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-06-18 Date last observed: 1991-07-10
Quad Name: UPPER SLIDE LAKE Precision:S

*014 BAT SURVEY STATION
County: Lincoln Elevation: 2150M
Meridian: 6P Town/Range -Section: 036N118W -36 NW4SE4
Location: GREYS RIVER DRAINAGE; AT MURPHY CREEK ALONG USFS RD #10002
EO Data: BAT SURVEY; USED BAT DETECTOR AND MIST NET; SET MIST NET OVER SMALL BEAVER POND NEXT TO MURPHY CREEK IN WET SEDGE MEADOW; CAUGHT 1 HOARY BAT, RELEASED, MEASUREMENTS: MALE, NON-SCROTAL, TL: 129, TAIL: 46, HF: 10, EAR: 14, TRAGUS: 6, WT: 30 GM, FOREARM: 55, CAUGHT 3' OVER WATER, HISSED AND GAVE AUDIBLE DISTRESS CLICKS, PASSIVE, DID NOT GIVE ECHOLOCATION CALLS; ALSO HEARD ABOUT 11 LITTLE BROWN BATS AND 3 MYOTIS SPP., SLOWER THAN THE LATTER, BUT SAME FREQ.; HABITATS INCLUDED: OPEN WATER (CREEK, BEAVER POND), CLEARINGS (WET MEADOW), CONIFEROUS FOREST SURROUNDING MEADOW.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-05 Date last observed:
Quad Name: DEER CREEK Precision:S

*015 BAT SURVEY STATION
County: Teton Elevation: 2100M
Meridian: 6P Town/Range -Section: 042N113W -16 S2NW4
Location: GROS VENTRE RIVER VALLEY; ON USFS RD #30400, WHERE IT CROSSES CRYSTAL CREEK (CRYSTAL CREEK BRIDGE)
EO Data: BAT SURVEY; USED MIST NET AND BAT DETECTOR; FROM 0920-1125 HRS (2 HRS TOTAL); SET NET ACROSS CRYSTAL CREEK, JUST DOWNSTREAM FROM BRIDGE; HABITATS INCLUDED: MANMADE STRUCTURE (BRIDGE), RIPARIAN (WILLOWS), OPEN WATER (CREEK), GRASSLANDS, SHRUBLANDS (SAGE); ABOUT 5 LITTLE BROWN BATS

OBSERVED. ALSO CHECKED WITH BAT DETECTOR ON 20 JULY FROM 2220-2300 HRS (0.5 TOTAL) 3 UNID BATS HEARD, PEAK AT 40 KHZ, RANGE (NO GOOD READINGS) FROM 35-45 KHZ, LOUD AND SLOW (LIKE HOARY BAT); ALSO ANOTHER UNID BAT WITH A PEAK OF 38 KHZ, NO RANGE READING; 1 LITTLE BROWN BAT. CHECKED AGAIN ON 22 JULY WITH BAT DETECTOR FROM 2150-2300 HRS (1.1 HRS TOTAL); ABOUT 6 LITTLE BROWN BATS IN AREA, FLYING 10-15' ABOVE CREEK, COULD HEAR RANGE OF 30-100 KHZ, PEAK 44 KHZ, MOST LATER FLYING AT WATER SURFACE, SOME WITHIN 1-2' OF ONE ANOTHER, FORAGE IN CIRCULAR ROUTES OVER SLOWER SECTIONS OF CREEK; HEARD UNID BAT 2150 HRS, PEAK AT 38 KHZ, RANGE 25-35 KHZ; SECOND UNID BAT HEARD AT 2259 HRS, PEAK AT 44 KHZ FROM 20' DISTANT, FLEW FASTER THAN MYOTIS. CHECKED AGAIN ON 24 JULY FROM 2314-2335 HRS (.25 HRS TOTAL); ABOUT 5 LITTLE BROWN BATS WORKING AREA.

Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-25 Date last observed:
Quad Name: GRIZZLY LAKE Precision:S

*016 - BAT SURVEY STATION
County: Lincoln Elevation: 1900M
Meridian: 6P Town/Range -Section: 035N117W -09 NW4NW4

Location: GREYS RIVER DRAINAGE; AT CONFLUENCE OF GREYS RIVER AND LOST CREEK ALONG USFS RD #10138
EO Data: BAT SURVEY; USED MIST NET AND BAT DETECTOR; FROM 2145-2330 HRS (1.75 HRS TOTAL); SET MIST NET ACROSS GREYS RIVER (PORTION OF); HOARY BATS EMERGED AT 2150 HRS, COMMON, 2-5 WORKING IN AREA; COULD HEAR THEM UP TO 75' AWAY; FLYING ABOUT 70' OVER RIVER; PEAK ABOUT 26 KHZ; RANGE 22-40 KHZ; LAST HOARY BAT HEARD AT 2220 HRS, ALSO HEARD HIGH PITCHED SQUEAKS (FROM HOARY BATS?); ABOUT 4 LITTLE BROWN BATS IN AREA; RANGE 30-70 KHZ, PEAK AT 44 KHZ; ALSO HEARD AN UNIDENTIFIED BAT WITH A PEAK OF 40 KHZ AND A RANGE OF 30-50 KHZ AT ABOUT HALF THE RATE OF THE LITTLE BROWN BAT.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-06 Date last observed:
Quad Name: DEER CREEK Precision:S

*019 BAT SURVEY STATION
County: Lincoln Elevation: 1900M
Meridian: 6P Town/Range -Section: 036N117W -05 SE4NE4
Location: GREYS RIVER DRAINAGE; ON GREYS RIVER ABOUT 1/3 MI N OF DEAD DOG CREEK
EO Data: BAT SURVEY; USED MIST NET AND BAT DETECTOR FROM 2200-2330 HRS (1.5 HRS TOTAL); SET NET OVER OXBOW OF GREYS RIVER BY ROAD; HEARD HOARY BAT AT 2225 (2 PASSES); 3-5 LITTLE BROWN BATS IN AREA FLYING CLOSE TO WATERS SURFACE; ALSO HEARD UNID BAT WITH PEAK AT 40 KHZ, NO RANGE DATA; NONE CAPTURED; HABITATS INCLUDED: OPEN WATER (RIVER); GRAVEL BAR; RIPARIAN (WILLOWS AND WET SEDGE MEADOW).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-08 Date last observed:
Quad Name: DEER CREEK Precision:S

*024 BAT SURVEY STATION
County: Teton Elevation: 2150M
Meridian: 6P Town/Range -Section: 042N113W -18 NE4NE4
Location: GROS VENTRE RIVER AT BRIDGE CROSSING RIVER ON USFS RD #30400
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2224-2234 HRS (0.1 HRS TOTAL); NONE HEARD; HABITATS INCLUDED: MANMADE STRUCTURE (BRIDGE), OPEN WATER (RIVER), SHRUBLAND (SAGE) AND

CONIFEROUS FOREST (SPRUCE AND FIR). CHECKED AGAIN ALONG ROAD RUNNING N ALONG RIVER, ON W SIDE OF RIVER, DOWN TO BRIDGE; CHECKED WITH BAT DETECTOR FROM 2208-2308 HRS (1 HR TOTAL); HEARD UNID BAT AT 2220 HRS WITH PEAK AT 38 KHZ AND RANGE OF 30-50 KHZ, SLOW LIKE HOARY BAT CALLS; RECORDED ABOUT 21 PASSES BY MYOTIS, PROBABLY MOSTLY LITTLE BROWN BATS.

Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-19 Date last observed:
Quad Name: GRIZZLY LAKE Precision:S

*025 BAT SURVEY STATION
County: Teton Elevation: 2150M
Meridian: 6P Town/Range -Section: 042N113W -23 NW4NE4
Location: GROS VENTRE RIVER; ALONG RIVER FLOODPLAIN BY RIVER; JUST N OF USFS RD #30400
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2140-2210 HRS (0.5 HRS TOTAL); HEARD ONE HOARY BAT AT 2140 HRS; HEARD ONE LITTLE BROWN BAT AT 2142 HRS; HABITATS INCLUDED: RIPARIAN, OPEN WATER (BEAVER PONDS, RIVER); FORESTED AREA (CONIFERS) AND CLIFFS.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-20 Date last observed:
Quad Name: GRIZZLY LAKE Precision:S

*028 BAT SURVEY STATION
County: Sublette Elevation: 2450M
Meridian: 6P Town/Range -Section: 039N109W -13 NE4SW4
Location: GREEN RIVER DRAINAGE, GREEN RIVER LAKES AREA, ABOUT 2 MI DOWNSTREAM FROM LAKES ALONG RIVER N OF USFS RD #091
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2110-2150 HRS (~0.5 HRS TOTAL); HEARD FIRST LITTLE BROWN BAT AT 2112, HEARD 11 PASSES TOTAL; HEARD ONE HOARY BAT AT 2116; HABITATS INCLUDED: OPEN WATER (RIVER); CLIFFS, SHRUBLAND (SAGE) AND CLEARINGS (OPEN WET SEDGE MEADOW), ALSO, FORESTED AREAS (PRIMARILY CONIFERS).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-08-03 Date last observed:
Quad Name: GREEN RIVER LAKES Precision:S

*032 BAT SURVEY STATION
County: Teton Elevation: 2250M
Meridian: 6P Town/Range -Section: 044N118W -21 SEC ALONG USFS RD: R118W- S21,22,23,24; R117W- S19,20
Location: TETON CANYON CREEK; SURVEYED ALONG ALL OF USFS RD #009
EO Data: BAT SURVEY; USED BAT DETECTOR FOR ROAD TRANSECT; STOPPED AT 0.5 MI INTERVALS AND LISTENED FOR 10 MIN; STARTED AT TETON CANYON CAMPGROUND AND HEADED WEST; STARTED AT 2110-2312 HRS (2 HRS TOTAL); 8 STATIONS TOTAL; STATION 1: 2 UNID BATS, MYOTIS? AND 1 HOARY BAT?, LATTER FLYING ABOUT 125' UP IN AIR; STATION 2; NONE HEARD; STATION 3: UNID BAT WITH PEAK AT 38 KHZ, LITTLE FASTER THAN HOARY BAT; STATION 4: 8 HOARY BAT PASSES, FREQ RANGE 20-75 KHZ; STATION 5: 3 LITTLE BROWN BATS AND 1 HOARY BAT PASS; STATION 6: 3 LITTLE BROWN BAT PASSES; STATION 7: 1 MYOTIS, 1 UNID BAT; STATION 8: NONE HEARD; STATION 9: 11 PASSES BY MYOTIS, 1 UNID BAT; HABITATS INCLUDED: RIPARIAN (WILLOWS, CONIFERS), OPEN WATER (CREEK), CLEARINGS (MEADOWS), SHRUBLAND (SAGE), CLIFFS AND FORESTED AREAS. ALSO SURVEYED AGAIN WITH BAT DETECTOR/ TRANSECT ON 3 SEPT FROM 2106-2258 HRS (~2 HRS TOTAL); 8 STATIONS; STATION 1: 1

LITTLE BROWN BAT AND 4 UNID OTHERS (PROB SAME); STATION 2: 1 UNID BAT; STATION 3: 5 UNID BATS, 1 LITTLE BROWN BAT; STATION 4; NONE; STATION 5: NONE; STATION 6: NONE; STATION 7: 1 UNID; STATION 8: NONE. (MAINLY LODGEPOLE PINE, DOUGLAS FIR, SOME ASPEN, MOUNTAIN MAHOGANY); NOTED MANY MOTHS ALONG ROAD.

Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-08 Date last observed:
Quad Name: GRANITE BASIN Precision:S

*036 BAT SURVEY STATION
County: Teton Elevation: 1905M
Meridian: 6P Town/Range -Section: 038N116W -29 NE4NE4
Location: SNAKE RIVER,"GRAND CANYON" OF SNAKE RIVER ON N SIDE OF RIVER ON HWY 26/89
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2131-2146 (0.25 HRS TOTAL) AT THIS STATION; 3 HOARY BAT PASSES AND 2 LITTLE BROWN BAT PASSES; HABITATS INCLUDED: OPEN WATER (RIVER), CLIFFS (TALUS SLOPE) AND A FEW DOUGLAS FIR SNAGS.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-18 Date last observed:
Quad Name: PINE CREEK Precision:S

*037 BAT SURVEY STATION
County: Teton Elevation: 1905M
Meridian: 6P Town/Range -Section: 038N116W -29 SW4SW4
Location: SNAKE RIVER,"GRAND CANYON" OF SNAKE RIVER ON N SIDE OF RIVER ON HWY 26/89
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2253-2308 (0.25 HRS TOTAL) AT THIS STATION; 3 HOARY BAT PASSES, 1 LITTLE BROWN BAT PASSES AND 1 UNID BAT PASS; HABITATS INCLUDED: OPEN WATER (RIVER), FORESTED AREAS (SCATTERED JUNIPER AND DOUGLAS FIR), GRASSLAND, SHRUBLAND (SAGE) AND GRAVEL BARS ALONG RIVER
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-18 Date last observed:
Quad Name: PINE CREEK Precision:S

*038 BAT SURVEY STATION
County: Teton Elevation: 1905M
Meridian: 6P Town/Range -Section: 038N116W -29 SW4SW4
Location: SNAKE RIVER,"GRAND CANYON" OF SNAKE RIVER ON N SIDE OF RIVER ON HWY 26/89 AT ELBOW CAMPGROUND
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2315-2330 (0.25 HRS TOTAL) AT THIS STATION; 1 HOARY BAT PASS, 1 LITTLE BROWN BAT PASS AND 4 UNID BAT PASSES; HABITATS INCLUDED: OPEN WATER (RIVER), FORESTED AREAS (DOUGLAS FIR), AND GRAVEL BARS ALONG RIVER.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-18 Date last observed:
Quad Name: PINE CREEK Precision:S

*047 BAT SURVEY STATION
County: Teton Elevation: 2225M
Meridian: 6P Town/Range -Section: 042N118W -32 NW4NW4
Location: MOOSE CREEK; AT END OF USFS RD #276 NEAR USFS CAMPGROUND
EO Data: BAT SURVEY; SET MIST NET ACROSS (ALL OF) MOOSE CREEK; ALSO USED BAT DETECTOR; FROM 2030-2245 HRS (~1.25 HRS TOTAL); NO BATS CAPTURED; 5 UNID BAT PASSES AND 2 UNID BATS WITH PEAK OF 35 KHZ AND RANGE OF 25-60 KHZ; ALSO 8 PASSES BY LITTLE BROWN BATS (ABOUT 2-3 BATS); ALSO 1 PASS BY HOARY BAT AT

2157; HABITATS INCLUDED: RIPARIAN (WILLOWS, GRASSES, ETC.), OPEN WATER (CREEK), AND FORESTED AREAS (ASPEN, LODGEPOLE PINE AND SPRUCE).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-09-05 Date last observed:
Quad Name: VICTOR Precision:S

*049 BAT SURVEY STATION
County: Teton Elevation: 2115M
Meridian: 6P Town/Range -Section: 047N118W -04 SW4NE4
Location: SOUTH BOONE CREEK WHERE USFS RD #261 CROSSES
EO Data: BAT SURVEY; LISTENED AT STATION FROM 2110-2135 HRS (~.25 HRS); HABITATS INCLUDED: OPEN WATER (CREEK) AND FORESTED AREAS (LODGEPOLE PINE/ SNAGS). 4 PASSES BY HOARY BATS, RANGE 25-60 KHZ; 6 PASSES BY UNID BATS; 9 PASSES BY LITTLE BROWN BATS.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-06-08 Date last observed:
Quad Name: INDIAN LAKE Precision:S

*050 BAT SURVEY STATION
County: Teton Elevation: 2120M
Meridian: 6P Town/Range -Section: 048N118W -25 SW4SW4
Location: MIDDLE BOONE CREEK, WHERE USFS RD #261 CROSSES
EO Data: BAT SURVEY; LISTENED AT STATION FROM 2130-2150 HRS (~.25 HRS); 2 PASSES BY LITTLE BROWN BAT; HABITATS INCLUDED: OPEN WATER (CREEK), RIPARIAN (WILLOWS), CLEARINGS (MEADOWS) AND FORESTED AREAS (LODGEPOLE PINE/ SNAGS). ALSO SET MIST NET ACROSS CREEK, JUST N OF RD ON 8 AUGUST; FROM 2030-2145 HRS (1.25 HRS TOTAL); NONE CAUGHT; ALSO LISTENED WITH BAT DETECTOR, HEARD 1 HOARY BAT AND OBSERVED ABOUT 3 LITTLE BROWN BATS IN AREA.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-06-08 Date last observed:
Quad Name: HOMINY PEAK Precision:S

*051 BAT SURVEY STATION
County: Teton Elevation: 2125M
Meridian: 6P Town/Range -Section: 048N117W -19 NW4SE4
Location: NORTH BOONE CREEK, WHERE USFS RD #261 CROSSES
EO Data: BAT SURVEY; LISTENED AT STATION FROM 2200-2220 HRS (~.25 HRS); 1 PASS BY LITTLE BROWN BAT; 2 BY HOARY BAT, 7 BY UNID BATS; HABITATS INCLUDED: OPEN WATER (CREEK), RIPARIAN (WILLOWS), CLEARINGS (MEADOWS) AND FORESTED AREAS (LODGEPOLE PINE, SPRUCE).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-06-08 Date last observed:
Quad Name: HOMINY PEAK Precision:S

*052 BAT SURVEY STATION
County: Teton Elevation: 2360M
Meridian: 6P Town/Range -Section: 048N117W -15 SW4NW4
Location: CALF CREEK, WHERE USFS RD #261 CROSSES
EO Data: BAT SURVEY; LISTENED AT STATION FROM 2244-2313 HRS (~0.5 HRS); 1 PASS BY LITTLE BROWN BAT; 2 UNID BATS AND 2 BY HOARY BATS; HABITATS INCLUDED: OPEN WATER (CREEK), RIPARIAN (WILLOWS), CLEARINGS (MEADOWS) AND FORESTED AREAS (LODGEPOLE PINE, SPRUCE).
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-06-08 Date last observed:
Quad Name: MCDONALD RESERVOIR Precision:S

APPENDIX 5: LISTING OF LOCATIONS WHERE SILVER-HAIRED BATS MAY HAVE BEEN DETECTED

Note: Numbers listed below corespond to numbers on map in Figure 2.

*015 BAT SURVEY STATION
County: Teton Elevation: 2100M
Meridian: 6P Town/Range -Section: 042N113W -16 S2NW4
Location: GROS VENTRE RIVER VALLEY; ON USFS RD #30400, WHERE IT CROSSES CRYSTAL CREEK (CRYSTAL CREEK BRIDGE)
EO Data: BAT SURVEY; USED MIST NET AND BAT DETECTOR; FROM 0920-1125 HRS (2 HRS TOTAL); SET NET ACROSS CRYSTAL CREEK, JUST DOWNSTREAM FROM BRIDGE; HABITATS INCLUDED: MANMADE STRUCTURE (BRIDGE), RIPARIAN (WILLOWS), OPEN WATER (CREEK), GRASSLANDS, SHRUBLANDS (SAGE); ABOUT 5 LITTLE BROWN BATS OBSERVED. ALSO CHECKED WITH BAT DETECTOR ON 20 JULY FROM 2220-2300 HRS (0.5 TOTAL) 3 UNID BATS HEARD, PEAK AT 40 KHZ, RANGE (NO GOOD READINGS) FROM 35-45 KHZ, LOUD AND SLOW (LIKE HOARY BAT; POSSIBLY BIG BROWN BAT?); ALSO ANOTHER UNID BAT WITH A PEAK OF 38 KHZ, NO RANGE READING (SILVER-HAIRED BAT?); 1 LITTLE BROWN BAT. CHECKED AGAIN ON 22 JULY WITH BAT DETECTOR FROM 2150-2300 HRS (1.1 HRS TOTAL); ABOUT 6 LITTLE BROWN BATS IN AREA, FLYING 10-15' ABOVE CREEK, COULD HEAR RANGE OF 30-100 KHZ, PEAK 44 KHZ, MOST LATER FLYING AT WATER SURFACE, SOME WITHIN 1-2' OF ONE ANOTHER, FORAGE IN CIRCULAR ROUTES OVER SLOWER SECTIONS OF CREEK; HEARD UNID BAT 2150 HRS, PEAK AT 38 KHZ, RANGE 25-60 KHZ (SILVER-HAIRED BAT?); SECOND UNID BAT HEARD AT 2259 HRS, PEAK AT 44 KHZ FROM 20' DISTANT, FLEW FASTER THAN MYOTIS. CHECKED AGAIN ON 24 JULY FROM 2314-2335 HRS (.25 HRS TOTAL); ABOUT 5 LITTLE BROWN BATS WORKING AREA.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-25
Quad Name: GRIZZLY LAKE Precision: S

*017 BAT SURVEY STATION
County: Lincoln Elevation: 1900M
Meridian: 6P Town/Range -Section: 035N117W -09 NW4NW4
Location: GREYS RIVER DRAINAGE; AT MURPHY CREEK BRIDGE ON USFS RD #10002, NEAR CONFLUENCE OF MURPHY CREEK AND GREYS RIVER
EO Data: BAT SURVEY; USED BAT DETECTOR; FROM 2210-2300 HRS (1 HR TOTAL); ABOUT 3 LITTLE BROWN BATS IN AREA; HEARD UNID BAT AT 2131 WITH PEAK AT 40 KHZ WITH A RANGE OF 30-50 KHZ (HEARD 2 TIMES; BIG BROWN BAT?); ANOTHER UNID BAT WITH PEAK AT ABOUT 38 KHZ AND A RANGE OF 25-60 KHZ (SILVER-HAIRED BAT?); HABITAT INCLUDED: MANMADE STRUCTURE (BRIDGE), OPEN WATER (CREEK), CONIFEROUS FOREST AND RIPARIAN (WILLOWS)
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-07
Quad Name: DEER CREEK Precision: S

*023 BAT SURVEY STATION
County: Teton Elevation: 2150M
Meridian: 6P Town/Range -Section: 042N113W -23 NE4NW4
Location: GROS VENTRE RIVER DRAINAGE; ALONG ALKALI CREEK, A TRIBUTARY OF THE GROS VENTRE; JUST N OF USFS RD #30400
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2130-2200 HRS (0.5 HRS TOTAL); HEARD ABOUT 2 LITTLE BROWN BATS; AND UNID BAT WITH PEAK AT 38 KHZ AND RANGE OF ABOUT 25-60 KHZ- FLEW SLOWER THAN LITTLE BROWN BAT WITH A MORE DIRECT FLIGHT ABOUT 20' OVER GROUND, COULD DETECT FROM -50' DISTANT (SILVER-HAIRED BAT?); HABITATS INCLUDED: RIPARIAN (BEAVER PONDS/ CREEK AND

WET MEADOW), OPEN WATER (BEAVER POND), CLEARINGS (WET MEADOW), FORESTED AREA (SCATTERED DOUGLAS FIR AND ASPENS).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-19
Quad Name: GRIZZLY LAKE Precision: S

*024 BAT SURVEY STATION
County: Teton Elevation: 2150M
Meridian: 6P Town/Range -Section: 042N113W -18 NE4NE4
Location: GROS VENTRE RIVER AT BRIDGE CROSSING RIVER ON USFS RD #30400
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2224-2234 HRS (0.1 HRS TOTAL); NONE HEARD; HABITATS INCLUDED: MANMADE STRUCTURE (BRIDGE), OPEN WATER (RIVER), SHRUBLAND (SAGE) AND CONIFEROUS FOREST (SPRUCE AND FIR). CHECKED AGAIN ALONG ROAD RUNNING N ALONG RIVER, ON W SIDE OF RIVER, DOWN TO BRIDGE; CHECKED WITH BAT DETECTOR FROM 2208-2308 HRS (1 HR TOTAL); HEARD UNID BAT AT 2220 HRS WITH PEAK AT 38 KHZ AND RANGE OF 30-50 KHZ, SLOW LIKE HOARY BAT CALLS (SILVER-HAIRED BAT?); RECORDED ABOUT 21 PASSES BY MYOTIS, PROBABLY MOSTLY LITTLE BROWN BATS.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-19
Quad Name: GRIZZLY LAKE Precision: S

*026 BAT SURVEY STATION
County: Teton Elevation: 2250M
Meridian: 6P Town/Range -Section: 042N112W -29 SE4NW4
Location: GROS VENTRE RIVER DRAINAGE; VICINITY OF RIVER AND UPPER SLIDE LAKE
EO Data: BAT SURVEY; CHECKED ALONG GROS VENTRE RIVER AND AT SMALL (1 ACRE) LAKE JUST SOUTH OF RIVER; USED BAT DETECTOR; AT RIVER: CHECKED FROM 2130-2205 HRS (0.5 HRS TOTAL); HEARD 1 UNID BAT WITH PEAK AT 38 KHZ AND RANGE ABOUT 35-50 KHZ (NOT A GOOD READING) HEARD AT 2159 (SILVER-HAIRED BAT?); ALSO HEARD ONE LITTLE BROWN BAT; AT LAKE: START AT 2213-2236 HRS (0.5 HRS TOTAL); ABOUT 4 LITTLE BROWN BATS OBSERVED FORAGING ON LAKE, MIST ON LAKE, ALSO HEARD 1 UNID BAT WITH PEAK AT 38 KHZ (SILVER-HAIRED BAT?); HABITATS INCLUDED: RIPARIAN (WILLOWS, SEDGE MEADOWS), OPEN WATER (LAKE, RIVER), AND CLEARINGS (MEADOWS).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-07-23
Quad Name: UPPER SLIDE LAKE Precision: S

*029 BAT SURVEY STATION
County: Sublette Elevation: 2400M
Meridian: 6P Town/Range -Section: 038N110W -02 SW4
Location: GREEN RIVER DRAINAGE, KENDALL WARM SPRINGS, ALONG USFS RD #091
EO Data: BAT SURVEY; USED BAT DETECTOR FROM 2125-2155 HRS (-0.5 HRS TOTAL); ONE UNIDENTIFIED BAT HEARD, DID NOT GET A GOOD READING; WALKED ALONG ENTIRE LENGTH OF WARM SPRINGS TO RIVER; HABITATS INCLUDED: OPEN WATER (WARM SPRINGS) AND CLEARINGS (WET SEDGE MEADOW). ABOUT .2MI AWAY); CLIFFS, SHRUBLAND (SAGE) AND CLEARINGS (OPEN WET SEDGE MEADOW), ALSO, FORESTED AREAS (PRIMARILY LODGEPOLE PINE). ALSO WALKED ALONG GREEN RIVER UPSTREAM FROM WARMSPRINGS CONFLUENCE AND LISTENED WITH BAT DETECTOR FROM 2200-2215 HRS (.25 HRS TOTAL); HEARD ONE UNID BAT WITH PEAK ABOUT 38 KHZ, DID NOT GET A GOOD READING (SILVER-HAIRED BAT?).
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-08-04

Quad Name: KLONDIKE HILL Precision: S

*032 BAT SURVEY STATION
County: Teton Elevation: 2250M
Meridian: 6P Town/Range -Section: 044N118W -21 SEC ALONG USFS RD: R118W- S21,22,23,24; R117W- S19,20
Location: TETON CANYON CREEK; SURVEYED ALONG ALL OF USFS RD #009
EO Data: BAT SURVEY; USED BAT DETECTOR FOR ROAD TRANSECT; STOPPED AT 0.5 MI INTERVALS AND LISTENED FOR 10 MIN; STARTED AT TETON CANYON CAMPGROUND AND HEADED WEST; STARTED AT 2110-2312 HRS (2 HRS TOTAL); 8 STATIONS TOTAL; STATION 1: 2 UNID BATS, MYOTIS? AND 1 HOARY BAT?, LATTER FLYING ABOUT 125' UP IN AIR; STATION 2; NONE HEARD; STATION 3: UNID BAT WITH PEAK AT 38 KHZ, LITTLE FASTER THAN HOARY BAT (SILVER-HAIRED BAT?); STATION 4: 8 HOARY BAT PASSES, FREQ RANGE 20-75 KHZ; STATION 5: 3 LITTLE BROWN BATS AND 1 HOARY BAT PASS; STATION 6: 3 LITTLE BROWN BAT PASSES; STATION 7: 1 MYOTIS, 1 UNID BAT; STATION 8: NONE HEARD; STATION 9: 11 PASSES BY MYOTIS, 1 UNID BAT; HABITATS INCLUDED: RIPARIAN (WILLOWS, CONIFERS), OPEN WATER (CREEK), CLEARINGS (MEADOWS), SHRUBLAND (SAGE), CLIFFS AND FORESTED AREAS. ALSO SURVEYED AGAIN WITH BAT DETECTOR/ TRANSECT ON 3 SEPT FROM 2106-2258 HRS (~2 HRS TOTAL); 8 STATIONS; STATION 1: 1 LITTLE BROWN BAT AND 4 UNID OTHERS (PROB SAME); STATION 2: 1 UNID BAT; STATION 3: 5 UNID BATS, 1 LITTLE BROWN BAT; STATION 4; NONE; STATION 5: NONE; STATION 6: NONE; STATION 7: 1 UNID; STATION 8: NONE. (MAINLY LODGEPOLE PINE, DOUGLAS FIR, SOME ASPEN, MOUNTAIN MAHOGANY); NOTED MANY MOTHS ALONG ROAD.
Management Unit: TARGHEE NATIONAL FOREST
Date Last surveyed: 1991-08-08
Quad Name: GRANITE BASIN Precision: S

*040 BAT SURVEY STATION
County: Sublette Elevation: 2245M
Meridian: 6P Town/Range -Section: 003N107W -03 SEC ALONG USFS RD: 3,7,8, & 9
Location: BOULDER LAKE; SURVEYED ALONG USFS RD 10-104 FROM S BORDER OF USFS LANDS TO NE ALONG S SIDE OF BOULDER LAKE
EO Data: BAT SURVEY; USED BAT DETECTOR ALONG ROAD SURVEY ROUT; STOPPED AT 0.5 MI INTERVALS AND LISTENED FOR 10 MIN; 6 STATIONS TOTAL; START 2156-2323 (~1.5 HRS TOTAL); STATION 1: NONE HEARD, HABITAT: SHRUBLAND (SAGE); STATION 2: SAME HABITAT, NONE HEARD; STATION 3: SAME HABITAT, 1 UNID BAT HEARD; STATION 4: 1 UNID BAT HEARD, SLOW/MED SPEED CLICKS, PEAK AT 34 KHZ, RANGE- ~25-45+ KHZ (SILVER-HAIRED BAT?, FRINGED MYOTIS ? (SUPPOSEDLY OUT OF RANGE)); HABITATS INCLUDED: SHRUBLAND (SAGE) AND FORESTED (SCATTERED ASPENS); STATION 5: 5 UNID BAT PASSES (SAME SPP AS STATION #4?), AND 1 LITTLE BROWN BAT; HABITATS INCLUDED: SAME AS #4 BUT DENSER ASPENS/ SAGE AND A FEW CONIFERS; STATION 6: SAME HABITAT, NONE HEARD.
Management Unit: BRIDGER-TETON NATIONAL FOREST
Date Last surveyed: 1991-08-19
Quad Name: BOULDER LAKE Precision: S

*041 BAT SURVEY STATION
County: Teton Elevation: 2240M
Meridian: 6P Town/Range -Section: 043N118W -22 NW4NE4
Location: DARBY CANYON ALONG DARBY CREEK JUST DOWNSTREAM OF CONFLUENCE

WITH TERRACE CREEK, SOUTH OF USFS RD #012

EO Data: BAT SURVEY; SURVEYED AT STATION NEXT TO CREEK WITH BAT DETECTOR FROM 2045-2145 HRS (1 HR TOTAL); 1 UNID BAT, 10 PASSES BY ANOTHER UNID BAT WITH PEAK AT ~38 KHZ AND RANGE OF 30-60 KHZ, LONG CALLS ~15 MS (SILVER-HAIRED BATS?); BAT ACTIVITY PEAKED AT 2110 HRS; ALSO HEARD 1 LITTLE BROWN BAT; HABITATS INCLUDED RIPARIAN (WILLOWS), OPEN WATER (CREEK), CLEARINGS (5 AC MEADOW), FORESTED AREA (SPRUCE AND SOME ASPEN).

Management Unit: TARGHEE NATIONAL FOREST

Date Last surveyed: 1991-08-30

Quad Name: MOUNT BANNON Precision: S

*044 BAT SURVEY STATION

County: Teton Elevation: 2200M

Meridian: 6P Town/Range -Section: 043N118W -19 SEC ALONG USFS RD; S 19,20,21, & 22

Location: DARBY CANYON AREA; SURVEYED ALONG USFS RD #012 ALONG DARBY CREEK FROM WESTERN USFS BOUNDARY AT START OF ROAD AND CONTINUED TO EAST.

EO Data: BAT SURVEY; SURVEYED ALONG USFS RD #012 STOPPING AT 0.5 MI INTERVALS AND LISTENING FOR 10 MIN; START 2045-2203 HRS (1.25 HRS TOTAL); 6 STATIONS TOTAL; STATION 1: 1 UNID, 1 UNID WITH PEAK AT 35 KHZ; (SILVER-HAIRED BAT?, FRINGED MYOTIS?- SUPPOSEDLY OUT OF RANGE) STATION 2: 4 PASSES BY LITTLE BROWN BAT; STATION 3; 3 UNID, 2 UNID WITH PEAK AT 35 KHZ; STATION 4; 4 UNID, 6 LITTLE BROWN BAT PASSES; 1 UNID WITH PEAK AT 35 KHZ (SILVER-HAIRED BAT?, FRINGED MYOTIS?- SUPPOSEDLY OUT OF RANGE); STATION 5; 1 UNID, 1 UNID WITH PEAK AT 35 KHZ (SILVER-HAIRED BAT?, FRINGED MYOTIS?- SUPPOSEDLY OUT OF RANGE) ; 3 LITTLE BROWN BAT PASSES; STATION 6: 3 LITTLE BROWN BAT PASSES; 2 UNID WITH PEAK AT 35 KHZ, (SILVER-HAIRED BAT?, FRINGED MYOTIS?- SUPPOSEDLY OUT OF RANGE) ; AND 2 UNID BATS; HABITATS INCLUDED: RIPARIAN, OPEN WATER (CREEK), CLEARINGS (MEADOWS) CLIFFS, AND FORESTED (CONIFERS AND ASPENS).

Management Unit: TARGHEE NATIONAL FOREST

Date Last surveyed: 1991-08-31

Quad Name: MOUNT BANNON Precision: M

*047 BAT SURVEY STATION

County: Teton Elevation: 2225M

Meridian: 6P Town/Range -Section: 042N118W -32 NW4NW4

Location: MOOSE CREEK; AT END OF USFS RD #276 NEAR USFS CAMPGROUND

EO Data: BAT SURVEY; SET MIST NET ACROSS (ALL OF) MOOSE CREEK; ALSO USED BAT DETECTOR; FROM 2030-2245 HRS (~1.25 HRS TOTAL); NO BATS CAPTURED; 5 UNID BAT PASSES AND 2 UNID BATS WITH PEAK OF 35 KHZ AND RANGE OF 25-60 KHZ (SILVER-HAIRED BAT?); ALSO 8 PASSES BY LITTLE BROWN BATS (ABOUT 2-3 BATS); ALSO 1 PASS BY HOARY BAT AT 2157; HABITATS INCLUDED: RIPARIAN (WILLOWS, GRASSES, ETC.), OPEN WATER (CREEK), AND FORESTED AREAS (ASPEN, LODGEPOLE PINE AND SPRUCE).

Management Unit: TARGHEE NATIONAL FOREST

Date Last surveyed: 1991-09-05

Quad Name: VICTOR Precision: S

APPENDIX 6:

A GUIDE TO THE IDENTIFICATION OF WYOMING BATS USING BAT DETECTORS

Compiled by Christopher S. Garber

WYOMING NATURAL DIVERSITY DATABASE/ THE NATURE CONSERVANCY
3165 University Station
Laramie, WY 82071
(307) 766-3441
1991

This guide was put together to assist in the identification of bats using the QMC Mini-2 Bat Detector. Information on the species specific calls were compiled for all species of bats known to inhabit Wyoming. It should be emphasized that it has been shown that there is regional variation in calls for each species and that calls will also vary depending on the bats activity. There is also apparently variation among individuals within some species. Also, some information on the frequency characteristics of some species of bats is lacking. It is recommended that bats be positively identified in your area by capturing a bat and releasing it in a large room to listen to its echolocation calls while recording this information; or by listening to bats at roosts where the species type has previously been identified.

Most of the natural history information which accompanies the frequency information is derived from Clark and Stromberg (1987) or Barbour and Davis (1969). Again it must be emphasized that there is a lack of data for most species of bats and the information presented here is by no means fully accurate or complete. It is recommended that persons considering conducting survey work using bat detectors obtain copies of the references in the bibliography for additional information.

Species are arranged here in taxonomic order. There is a summary chart at the end of the text which gives information on the frequency range and peak energy for each species, in order of maximum peak energy.

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Myotis lucifugus	ALB	37	81		4.8			Barclay, pers. comm., in Thomas, et al., 1987
Little brown myotis	BC	33.5	79.2	45.3	5			Herd and Fenton, 1983
	BC	>35			2-4			Fenton, et al, 1983
	MAN	40	88		3			Barclay, 1984
	ONT	38	78	45	<5		2,3	Fenton and Bell, 1981
	ONT	40	78	45			2	Fenton and Bell, 1979
	WA	40	>60		3-7			Thomas, et al, 1987
	?	40	80		5			Fenton and Obrist, 1990
	ONT?					10.1 +/-3.7m		Downes, 1982
	WY	30	110	44		8m		Garber, 1991

Maximum frequency range: 30-110 KHz
Most energy at: 45 kHz
Duration: 2-7 ms
Maximum detectable distance: 12m

Sound quality: A shorter type call (to 5 ms) that sweeps from about 80 to 40 kHz. Detector tuned to 40 kHz- rapid ticking sound. Also produces a honk vocalization.

Habits/flight: Roosts in caves and buildings; communal rooster. Probably the most common bat in Wyoming. Flight slow and erratic. Forages along riparian areas, streams, ponds, and along edges of vegetation 1.5-6 meters above the ground. In this study it was found that, little brown myotis typically emerges at dusk (about 2130-2150 hours in June); usually forage for about 2 hrs then leave the area and return to roost. They typically flew repeatedly in circular or elliptical routes, usually low over water about 0.2-1.3m but sometimes up to 10m. Calls were rapid "putts", speeding up to a "fuzzy" sound known as a "feeding buzz" (due to call rate being rapidly increased) when closing in on an insect.

Size: Small.

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Myotis yumanensis	BC	38.5	87.6	55.7	5			Herd and Fenton, 1983
Yuma myotis	?	40	80		5			Fenton and Obrist, 1990

Maximum frequency range: 38.5-87.6 kHz
Most energy at: 55.7 kHz
Duration: 5 ms
Maximum detectable distance:
Sound quality: A shorter type call (to 5 ms) that sweeps from about 80 to 40 kHz. Detector tuned to 40 kHz- ticking sound. Not distinguishable from L. borealis.
Detectable distance: At least 10 meters
Habits/flight: Associated with riparian areas and streams; usually feed over water. Leave roost a few minutes after sunset; usually return in about 2 hours. Uses man-made structures, mines and caves for roosts.
Size: Small

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Myotis keenii Keen's myotis		30	110	59	3	3.8m +/- 2.6m		

Frequency Range: 30-110 khz
Most energy at: 59 khz
Duration: 3 ms
Detectable distance: 3.8m +/- 2.6m (Downes, 1981)
Sound quality: Short soft call, very similar to M. evotis

Habits/flight: Ponderosa pine, mixed pine forests used as habitat. Roosts in caves and tree crevices. Forages along hillside and ridge tops; rather than riparian areas; can occupy dense forests. Elevational distribution may be limited to 1200-1900 meters. Will roost with other species; maternity roosts maybe separate form male roosts. Forages on the wing at shrub level. Emerges after dusk, sometimes forages again before dawn. Probably just occurs in the Black Hills area.
Size: Small

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Myotis evotus	BC	54	97	63	3		0	Fenton and Bell, 1981
Long-eared myotis	BC	40	100		1-2			Fenton, et al, 1983
	BC	30	86		2.2			Barclay, Pers. comm., in Thomas, et al., 1987
			WA	40	>60		1-3	Thomas, et al., 1987

Frequency range: 30-100 kHz
Most energy at: 63 kHz
Duration: 3 ms
Detectable distance: 2 meters
Habits/flight: Preferred habitat may be coniferous forests.
Sound quality: Produce very short (< 2 ms) calls that sweep from over 100 kHz to about 40 kHz. Very soft calls; similar to M. keenii
Roosts in caves, buildings and mines. Forages in open areas, over trees and near water. Emerges to forage well after sunset.
Size: Small

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Myotis thysanodes	AZ	30	60		1-2			Bell, 1979
Fringed myotis	AZ	31	49	34	8		2	Fenton and Bell, 1981

Frequency range: 30-60 kHz
Most energy at: 34 kHz
Duration: 8 ms
Sound quality:
Detectable distance:
Habits/flight: Roosts in caves, mines and buildings. Forage after dusk for 1-2 hours. Slow, complex erratic flight; very agile.
Size: Small

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Myotis volans	AZ	40	89	46	10		3	Fenton and Bell, 1981
Long-legged myotis	AZ	40	89	46			1	Fenton and Bell, 1979
	AZ	40	80		2-4			Bell, 1979
	BC	35	>40		4-8			Fenton, et al., 1983
	WA	35	>60		3-7			Thomas, 1987

Frequency range: 35-89 kHz
Most energy at: 46 kHz
Duration: 2-10 ms
Detectable distance:
Sound quality: Detector set at 40 kHz, chirps?
Habits/flight: Roosts in tree crevices, snags, buildings and rock crevasses. Direct, fast flights, often at tree top level. Solitary forager. Also forages under the canopy of deciduous trees. One of the earliest foraging bats, usually just leaves roost just after sunset. Rapid darting flight when approaching a prey item.
Size: Medium

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Myotis californicus	AZ	40	80		2			Bell, 1979
California myotis	AZ	37	67	43	2		2	Fenton and Bell, 1981
	AZ	40	82	45			1	Fenton and Bell, 1979
	BC	37	67	43	2		2	Fenton and Bell, 1981
	BC	>35			2-4			Fenton, et al., 1983
	WA	40	>60		2			Thomas, 1987

Frequency range: 35-82 kHz
Most energy at: 44 kHz
Duration: 6 ms
Detectable distance:
Sound quality:
Habits/flight: Relatively slow; feed at edge of trees at canopy height; do not forage in groups. Start foraging after sunset; peak activity about 1 hour after sunset.
Size: Small

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Myotis ciliolabrum	BC	41	55	44	5		0	Fenton and Bell, 1981
Small-footed myotis	WA	40	>60		1-3			Thomas, 1987

Frequency range: 40->60 kHz
Most energy at: 44 kHz
Duration: 1-5 ms
Detectable distance:
Sound quality:
Habits/flight: Agile flyer, can hover. Forage for about 1 hour after sunset. Hibernates in caves and mines.
Size: Small

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Lasionycteris noctivagans	AZ	25	60		4-6			Bell, 1979
Silver-haired bat	BC	25	30		>5			Fenton, et al., 1983
	MAN	25.1	46.3		9.4			Barclay, Pers. comm., in Thomas, et al., 1987
			WA	28	30		10-15	Thomas, et al., 1987

Frequency range: 25-60 kHz
Maximum energy at: About 35 kHz
Duration: 4-15 ms
Detectable distance: 20m
Habits/flight: Late flyers, emerging 2-3 hours after sunset, may also forage again 6-8 hours after sunset. Flight slow and erratic with many short glides. Occurs in coniferous and deciduous forests often in association with water. Have feeding routes of 50-90 meters. Roosts in tree foliage, hollow trees, mines, caves houses and under loose bark. Probably common. Forages several meters above the ground.
Size: Large

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Episticus fuscus	AZ	26	33	28	10		0	Fenton and Bell, 1981
Big brown bat	AZ		76	41			1	Fenton and Bell, 1979
	AZ	30	60		2-4.5		1	Bell, 1979
	BC	28	>35		4-8			Fenton, et al., 1983
	NY	25						Griffin, 1971
	ONT	27	48	28	10		3	Fenton and Bell, 1981
	WA	28-33	40-45		5-10			Thomas, et al., 1987

Frequency range: 25-60 kHz
Most energy at: 28 or 41 kHz
Duration: 10 ms
Sound quality: Calls up to 10 ms long that sweep from about 65 to 25 kHz. Detector tuned to 30 kHz- putt- like sound; 40 kHz- ticking sound. Calls about half the rate of M. lucifugus or M. yumaensis (at 40 kHz; can't hear the latter two species at 30 kHz). Also produces a honk call. Lower end of frequency may be audible to unaided ear. Calls may (?) also be heard as chirps.
Detectable distance: At least 10 meters.
Habits/flight: Large bat; probably very common. Roosts in buildings, rock crevices, caves, hollow trees,crevices in tree bark. Can be observed flying around lights at night. Forage over open meadows, tree-lined city streets, and around farm buildings. Frequently shifts roost sites.
Size: Large

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Lasiurus borealis	BC	40	45		>5			Fenton, et al., 1983
Red bat	MAN	45	75		6			Barclay, 1984
	?	25	65		10			Fenton and Obrist, 1990

Frequency range: 38-75 kHz
Duration: 5-10 ms
Sound quality: Detector tuned to 40 kHz- chirp-like sound. Not distinguishable from M. yumanensis.
Detectable distance: At least 10 meters
Habits/flight: Solitary, usually roost alone. Usually roosts in trees or shrubs. males and female may have different summer ranges; males occurring at higher elevations. Forage in early evening, 1-2 hours after sunset, within 900m of roost. Foraging flights fast at treetop level, with occasional dives toward the ground. Often feed under street lights.
Size: Large

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Lasiurus cinereus	AZ	26	39	28	15		2	Fenton and Bell, 1981
Hoary bat	BC	20	25		>5			Fenton, et al., 1983
	MAN	16.9	19.9		10.3			Barclay, Pers. comm., in Thomas, et al., 1987

Frequency range: 16.9-39 kHz
Most energy at: 28 kHz
Duration: 10-15 ms
Sound quality: Long (over 10ms) calls that sweep from about 25 to 18 kHz. Echolocation calls- If detector is tuned to 20 kHz and you hear a very chirp-like sound repeated about 5 times per second.
Detectable distance At least 10 meters
Habits/flight: Strong direct flight, high wing loading. Roosts in deciduous trees; roosting sites generally open from below and are 3-4 meters above the ground sometimes forage at very high altitudes. Will sometimes forage together in large groups. Fly late in the evening, 2-5 hours after sunset. In the study, hoary bats were observed to emerge at dusk and leave about 1/2 hour after arrival. Observed to be maneuverable in flight, sometimes speeding up in flight. Caught one 1m over water/ beaver pond. Have observed foraging up to 23m above water; typically forage high above water. Calls were loud, relatively long and evenly spaced and detectable from great distances.

Size: Medium- large

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Euderma maculatum	BC	8.6	14.5	10.9	5		2,3	Fenton and Bell, 1981
Spotted bat	BC	8.6	15.0	10.9		250m		Woodsworth, et al., 1981
	BC	6.0	12.0	8.3-10.8	5		2	Leonard and Fenton, 1984

Frequency range: 6.0-15.0 kHz
Most energy at: 10.9 kHz
Duration: 3.40 +/- 0.45 to 7.87 +/- 0.62 ms (Leonard and Fenton 1984)
Sound quality: Feeding calls usually detectable by human ear; "metallic squeek".
Detectable distance:
Habits/flight: Variety of habits including cliffs over perennial water. May roost singly in cliff crevices, sometimes in buildings. Forms maternity roosts.
Size: Large

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Plecotus townsendii	AZ	28	45		1-2			Bell, 1979
Townsend's big-eared bat	CA	20	50		2-5		1	Griffin, et al., 1963
	WA	28	40		6-7			Thomas, et al., 1987
	WY	25	75	29(75)				Garber, 1991

Frequency range: 20-50 kHz
Most energy at: 27 kHz
Duration: 1-7 ms
Detectable distance: 5m; although frequency range at the limits of the maximum detectable distance were about 26-35 KHz. Deductibility quickly decreased when more than 4m distant from the bat (Garber, 1991).
Sound quality: Second, quieter peak energy at kHz.
Habits/flight: Roosts and hibernates in caves, will use buildings for summer roosts. Females form maternity colonies in caves. Agile, slow flight with slow wing beats; fly with ears extended and tail down. Usually leaves roost from 4-5 hours after sunset, but has been observed leaving caves prior to sunset.
Size: Large

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Antrozous pallidus	AZ	26	49	30	5		2	Fenton and Bell, 1981
Pallid bat	AZ	25	55		2-3			Bell, 1979
	NM	25	50		5			Bell, 1982
	AZ (WY) (captive)							

Frequency range: 25-55 kHz
Most energy at: 30/ 40 kHz
Duration: 5 ms
Detectable distance: 5m (?)
Sound quality:
Habits/flight: Habitat generally lowland riparian cottonwoods in deserts and grasslands. Have also been taken in ponderosa pine habitat at 2100 meters. Often forages on the ground. Roosts and maternity roosts in rock crevices and buildings. Reportedly leaves roost about 1 hour before dawn to forage. Frequently shifts roost sites.
Size: Large

SPECIES	LOCATION	MINIMUM FREQUENCY KHZ	MAXIMUM FREQUENCY KHZ	MOST ENERGY KHZ	DURATION: MILLI SECONDS	MAXIMUM DETECTABLE DISTANCE	HARMONICS	SOURCE
Tadrida brasiliensis	AZ	42	62	43	15		0	Fenton and Bell, 1981
Brazilian free-tailed bat	AZ	25	43	27	15		2	Fenton and Bell, 1981

Frequency range: 42-62 kHz
Most energy at: 43 kHz (honks- 27 kHz)
Duration: 15 ms (maximum for both types of calls)
Sound quality: Also produces a honk call (about 10 ms at 50 kHz)
Detectable distance:
Habits/flight: Roosts in caves in large colonies. Strong fliers. May forage up to 64 km from roost. Forage over woodlands and along riparian areas. May forage up to 300m in altitude.
Size: Large

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BAT ECHOLOCATION FREQUENCIES IN ORDER OF MAXIMUM ENERGY

(includes name, frequency range, frequency of most energy and call duration in milliseconds; note detector tuned to 38 KHz should pick up all species)

Frequency in kilohertz

5////10////15////20////25////30////35////40////45////50////55////60////65////70////75////80////85////90////95////100////105////110////115////120

Euderma maculatum- Spotted bat: 6.0-15.0 KHz; most energy at 10.9 KHz; 5 ms.

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Plecotus townsendii- Townsend's big-eared bat: 20-50 KHz; most energy at 27 KHz; 7 ms.

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Lasiurus cinereus- Hoary bat: 17-41 KHz; most energy at 28/38 KHz; 10-15 ms.

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Episticus fuscus- Big brown bat: 25-60 KHz; most energy at 28/41 KHz; 10 ms.

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Myotis thysanodes- Fringed myotis: 30-60 KHz; most energy at 34 KHz; 8 ms.

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Lasionycteris noctivagans- Silver-haired bat: 25-60 KHz; most energy at 35 ms; 15 ms (typically shorter).

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Antrozous pallidus- Pallid bat: 25-55 KHz; most energy at 30/40 KHz; 5 ms.

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Tadrida brasiliensis- Brazilian free-tailed bat: 42-62 KHz; most energy at 43 KHz; 15 ms; also- honks have been recorded with a range of 25-43 KHZ; most energy at 27 KHz; both 15 ms

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Myotis californicus- California myotis: 35-82 KHz; most energy at 44 KHz; 6 ms.

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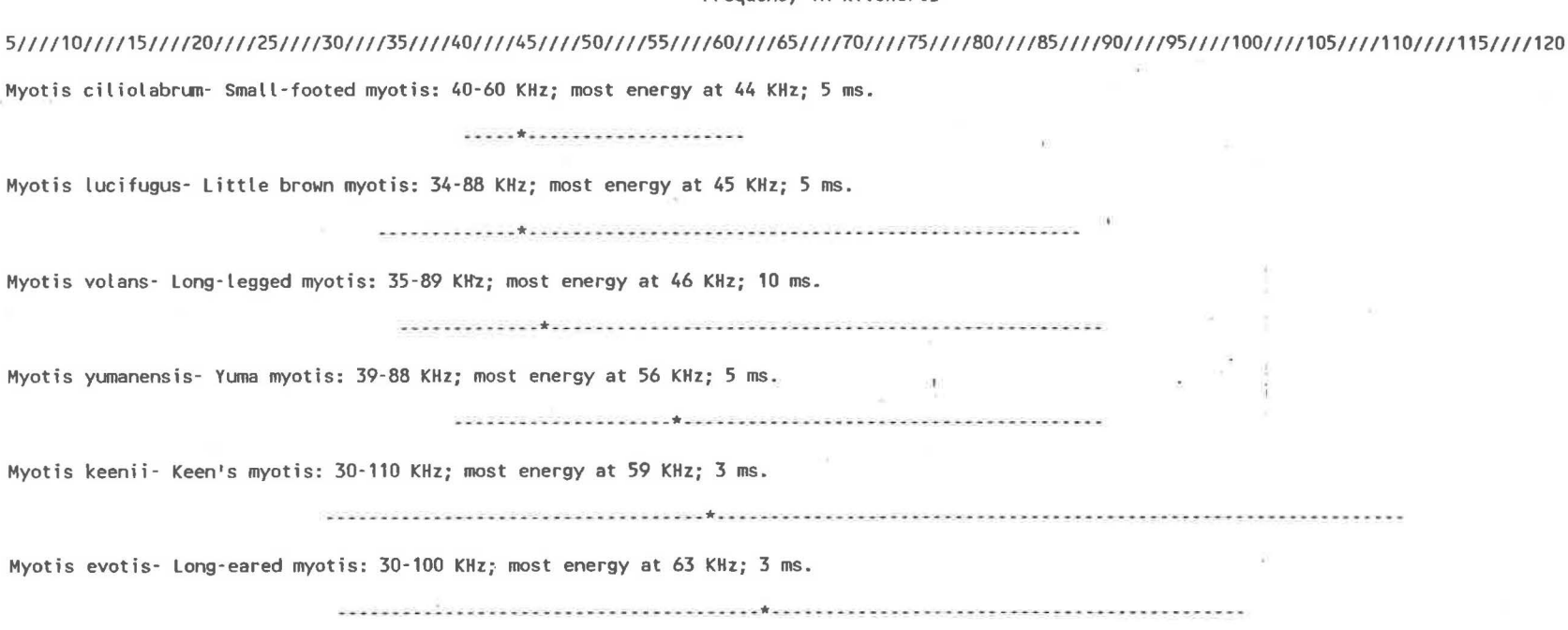
Frequency in kilohertz
5////10////15////20////25////30////35////40////45////50////55////60////65////70////75////80////85////90////95////100////105////110////115////120
Myotis ciliolabrum- Small-footed myotis: 40-60 KHz; most energy at 44 KHz; 5 ms.
Myotis lucifugus- Little brown myotis: 34-88 KHz; most energy at 45 KHz; 5 ms.
Myotis volans- Long-legged myotis: 35-89 KHz; most energy at 46 KHz; 10 ms.
Myotis yumanensis- Yuma myotis: 39-88 KHz; most energy at 56 KHz; 5 ms.
Myotis keenii- Keen's myotis: 30-110 KHz; most energy at 59 KHz; 3 ms.
Myotis evotis- Long-eared myotis: 30-100 KHz; most energy at 63 KHz; 3 ms.